

Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 169 of 647

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c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).EQ.0)) THEN
576        WRITE(30,576) BAFQ1P1UNIV
          FORMAT(I3,1X,$)
          COUNT=COUNT+1
          ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).NE.0).AND.
c            (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).NE.0).AND.
c            (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).NE.0).AND.
c            (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).EQ.0)) THEN
577        WRITE(30,577) BAFQ1P1UNIV
          FORMAT(I3,1X,$)
          COUNT=COUNT+1
          ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).NE.0).AND.
c            (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).NE.0).AND.
c            (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).NE.0).AND.
c            (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).EQ.0)) THEN
578        WRITE(30,578) BAFQ1P2UNIV
          FORMAT(I3,1X,$)
          COUNT=COUNT+1
          ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).NE.0).AND.
c            (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).NE.0).AND.
c            (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).EQ.0)) THEN
579        WRITE(30,579) BAFQ4P2UNIV
          FORMAT(I3,1X,$)
          COUNT=COUNT+1
          ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).NE.0).AND.
c            (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).EQ.0)) THEN
580        WRITE(30,580) BAFQ4P4UNIV
          FORMAT(I3,1X,$)
          COUNT=COUNT+1
          ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c            (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00 Attachment I, Page 170 of 647

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c          (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).EQ.0)) THEN
581      WRITE(30,581) FCOREUNIV
      FORMAT(I3,1X,$)
      COUNT=COUNT+1
      ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).NE.0)) THEN
582      WRITE(30,582) BAFQ2P3UNIV
      FORMAT(I3,1X,$)
      COUNT=COUNT+1
      ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).EQ.0)) THEN
583      WRITE(30,583) BAFQ4P3UNIV
      FORMAT(I3,1X,$)
      COUNT=COUNT+1
      ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).EQ.0)) THEN
584      WRITE(30,584) BAFQ4P3UNIV
      FORMAT(I3,1X,$)
      COUNT=COUNT+1
      ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).EQ.0)) THEN
585      WRITE(30,585) BAFQ4P1UNIV
      FORMAT(I3,1X,$)
      COUNT=COUNT+1
      ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.

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Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 171 of 647

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c      (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).NE.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).NE.0).AND.
c      (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).NE.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).NE.0)) THEN
586    WRITE(30,586) BAFQ4P3UNIV
      FORMAT(I3,1X,$)
      COUNT=COUNT+1
      ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).EQ.0)) THEN
587    WRITE(30,587) BAFQ2P3UNIV
      FORMAT(I3,1X,$)
      COUNT=COUNT+1
      ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).NE.0)) THEN
588    WRITE(30,588) BAFQ4P1UNIV
      FORMAT(I3,1X,$)
      COUNT=COUNT+1
      ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).NE.0)) THEN
589    WRITE(30,589) BAFQ3P1UNIV
      FORMAT(I3,1X,$)
      COUNT=COUNT+1
      ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).NE.0)) THEN
590    WRITE(30,590) BAFQ3P4UNIV
      FORMAT(I3,1X,$)
      COUNT=COUNT+1
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 172 of 647

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      ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).NE.0)) THEN
591      WRITE(30,591) BAFQ3P3UNIV
          FORMAT(I3,1X,$)
          COUNT=COUNT+1
      ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).NE.0)) THEN
592      WRITE(30,592) BAFQ3P3UNIV
          FORMAT(I3,1X,$)
          COUNT=COUNT+1
      ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).EQ.0)) THEN
593      WRITE(30,593) BAFQ2P1UNIV
          FORMAT(I3,1X,$)
          COUNT=COUNT+1
      ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).NE.0)) THEN
594      WRITE(30,594) BAFQ3P2UNIV
          FORMAT(I3,1X,$)
          COUNT=COUNT+1
      ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c          (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).NE.0).AND.
c          (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).NE.0)) THEN
595      WRITE(30,595) BAFQ3P3UNIV
          FORMAT(I3,1X,$)
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 173 of 647

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COUNT=COUNT+1
ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).NE.0).AND.
c      (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).NE.0).AND.
c      (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).NE.0)) THEN
596  WRITE(30,596) BAFQ2P2UNIV
      FORMAT(I3,1X,$)
      COUNT=COUNT+1
ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).NE.0).AND.
c      (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).NE.0).AND.
c      (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).EQ.0)) THEN
597  WRITE(30,597) BAFQ2P2UNIV
      FORMAT(I3,1X,$)
      COUNT=COUNT+1
ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).NE.0).AND.
c      (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).EQ.0)) THEN
598  WRITE(30,598) BAFQ2P4UNIV
      FORMAT(I3,1X,$)
      COUNT=COUNT+1
ELSEIF ((ASSYUNIV((CORECOLUMN-1),(COREROW-1)).NE.0).AND.
c      (ASSYUNIV((CORECOLUMN+0),(COREROW-1)).NE.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW-1)).NE.0).AND.
c      (ASSYUNIV((CORECOLUMN-1),(COREROW+0)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW+0)).NE.0).AND.
c      (ASSYUNIV((CORECOLUMN-1),(COREROW+1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+0),(COREROW+1)).EQ.0).AND.
c      (ASSYUNIV((CORECOLUMN+1),(COREROW+1)).EQ.0)) THEN
599  WRITE(30,599) BAFQ2P3UNIV
      FORMAT(I3,1X,$)
      COUNT=COUNT+1
ENDIF
ENDIF
IF ((MOD(COUNT,10).EQ.0).OR.
c   (CORECOLUMN.EQ.(LATWIDTH-4))) THEN
WRITE(30,*)
IF (COREROW.LT.(LATWIDTH-4)) THEN
WRITE(30,697)
697  FORMAT(T11,$)
ELSEIF ((COREROW.EQ.(LATWIDTH-4)).AND.

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Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 174 of 647

```

c          (CORECOLUMN.LT.(LATWIDTH-4))) THEN
          WRITE(30,698)
698        FORMAT(T11,$)
          ENDIF
          ENDIF
700        CONTINUE
710        CONTINUE
        ENDIF
*        Write the specifications for the universes which define the baffle
plate unit cells.
        WRITE(30,720)
720        FORMAT(T1,'C   CORE BAFFLE UNIVERSE SPECIFICATIONS')
        IF ((EIGHTH.EQ..TRUE.).OR.(QUARTER.EQ..TRUE.)) THEN
          BAFACDNORTHSURF=SN ! Nothern surface of baffle sections A, C, & D.
          SURFTYPESPEC(SN)='PY'
          SURFVALUESPEC(SN)=((ASSYPITCH/2.0)-
c          (BAFFLESEPARATION+BAFFLETHICKNESS))*(-1.0)
          SN=SN+1
          BAFACDSOUTHSURF=SN ! Southern surface of baffle sections A, C, & D.
          SURFTYPESPEC(SN)='PY'
          SURFVALUESPEC(SN)=((ASSYPITCH/2.0)-
c          BAFFLESEPARATION))*(-1.0)
          SN=SN+1
          BAFBCDEASTSURF=SN ! Eastern surface of baffle sections B, C, & D.
          SURFTYPESPEC(SN)='PX'
          SURFVALUESPEC(SN)=((ASSYPITCH/2.0)-
c          (BAFFLESEPARATION+BAFFLETHICKNESS))*(-1.0)
          SN=SN+1
          BAFBCDWESTSURF=SN ! Western surface of baffle sections B, C, & D.
          SURFTYPESPEC(SN)='PX'
          SURFVALUESPEC(SN)=((ASSYPITCH/2.0)-
c          BAFFLESEPARATION))*(-1.0)
          SN=SN+1
          BAFFLEML=MN
*        Check Core Baffle
          DO 723 C=1,BAFFLEISONUM
            IF (C.EQ.1) THEN
              WRITE(200,721) BAFFLEML, BAFFLEZAIDS(C),
c              (-1*BAFFLEWTS(C))
721            FORMAT(T1,'M',I4,T9,A9,3X,G14.6,
c              '$ Core Baffle')
            ELSE
              WRITE(200,722) BAFFLEZAIDS(C), (-1*BAFFLEWTS(C))
722            FORMAT(T9,A9,3X,G14.6)
            ENDIF
723            CONTINUE
          MN=MN+1
*        Write universe for baffle section A.
          WRITE(30,730) LN, BMODML, (-1*MODDENSITY), BAFACDNORTHSURF,
c          BAFQ1PIUNIV
730        FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,' IMP:N=1 U=',I2,
c          '$ Vertical baffle section water region')
          LN=LN+1
          WRITE(30,740) LN, BMODML, (-1*MODDENSITY),

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 175 of 647

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c (-1*BAFACDSOUTHSURF), BAFQ1P1UNIV
740 FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,' IMP:N=1 U=',I2,
c '$ Vertical baffle section water region')
LN=LN+1
WRITE(30,750) LN, BAFFLEML, (-1*BAFFLEDENSITY),
c (-1*BAFACDNORTHSURF), BAFACDSOUTHSURF, BAFQ1P1UNIV
750 FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,1X,I4,' IMP:N=1 U=',I2,
c '$ Vertical baffle section baffle region')
LN=LN+1
* Write universe for baffle section B.
WRITE(30,760) LN, BMODML, (-1*MODDENSITY), BAFBCDEASTSURF,
c BAFQ1P2UNIV
760 FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,' IMP:N=1 U=',I2,
c '$ Horizontal baffle section water region')
LN=LN+1
WRITE(30,770) LN, BMODML, (-1*MODDENSITY), (-1*BAFBCDWESTSURF),
c BAFQ1P2UNIV
770 FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,' IMP:N=1 U=',I2,
c '$ Horizontal baffle section water region')
LN=LN+1
WRITE(30,780) LN, BAFFLEML, (-1*BAFFLEDENSITY),
c (-1*BAFBCDEASTSURF), BAFBCDWESTSURF, BAFQ1P2UNIV
780 FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,1X,I4,' IMP:N=1 U=',I2,
c '$ Horizontal baffle section baffle region')
LN=LN+1
* Write universe for baffle section C.
WRITE(30,790) LN, BMODML, (-1*MODDENSITY), BAFBCDEASTSURF,
c BAFACDNORTHSURF, BAFQ1P3UNIV
790 FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,1X,I4,' IMP:N=1 U=',I2,
c '$ L-shaped baffle section water region')
LN=LN+1
WRITE(30,800) LN, BMODML, (-1*MODDENSITY), (-1*BAFBCDWESTSURF),
c (-1*BAFACDSOUTHSURF), BAFQ1P3UNIV
800 FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,':',I4,' IMP:N=1 U=',I2,
c '$ L-shaped baffle section water region')
LN=LN+1
WRITE(30,810) LN, BAFFLEML, (-1*BAFFLEDENSITY),
c (-1*BAFBCDEASTSURF), (-1*BAFACDNORTHSURF), BAFBCDWESTSURF,
c BAFACDSOUTHSURF, BAFQ1P3UNIV
810 FORMAT(T1,I4,T6,I4,T11,F7.4,T25,(' ',I4,':',I4,') (' ',I4,1X,I4,
c ') IMP:N=1 U=',I2,' '$ L-shaped baffle section baffle region')
LN=LN+1
* Write universe for baffle section D.
WRITE(30,820) LN, BMODML, (-1*MODDENSITY), BAFBCDEASTSURF,
c BAFACDNORTHSURF, BAFQ1P4UNIV
820 FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,':',I4,' IMP:N=1 U=',I2,
c '$ Corner baffle section water region')
LN=LN+1
WRITE(30,830) LN, BMODML, (-1*MODDENSITY), (-1*BAFBCDWESTSURF),
c (-1*BAFACDSOUTHSURF), BAFQ1P4UNIV
830 FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,1X,I4,' IMP:N=1 U=',I2,
c '$ Corner baffle section water region')
LN=LN+1
WRITE(30,840) LN, BAFFLEML, (-1*BAFFLEDENSITY),

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 176 of 647

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      c  (-1*BAFBCDEASTSURF), (-1*BAFACDNORTHSURF), BAFBCDWESTSURF,
      c  BAFACDSOUTHSURF, BAFQ1P4UNIV
840  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,(' ',I4,1X,I4,') (' ',I4,':',I4,
      c  ') IMP:N=1 U=',I2,' $ Corner baffle section baffle region')
      LN=LN+1
      ELSEIF (FULL.EQ..TRUE.) THEN
F, & G.  BAFACDFGNORTHSURF=SN ! Nothern surface of baffle sections A, C, D,
      SURFTYPESPEC(SN)='PY'
      SURFVALUESPEC(SN)=(-1.0*(ASSYPITCH/2.0))+
      c  (BAFFLESEPARATION+BAFFLETHICKNESS)
      SN=SN+1
      BAFACDFGSOUTHSURF=SN ! Southern surface of baffle sections A, C, D,
F, & G.  SURFTYPESPEC(SN)='PY'
      SURFVALUESPEC(SN)=(-1.0*(ASSYPITCH/2.0))+
      c  BAFFLESEPARATION
      SN=SN+1
      BAFBCDKLEASTSURF=SN ! Eastern surface of baffle sections B, C, D, K,
& L.  SURFTYPESPEC(SN)='PX'
      SURFVALUESPEC(SN)=(-1.0*(ASSYPITCH/2.0))+
      c  (BAFFLESEPARATION+BAFFLETHICKNESS)
      SN=SN+1
      BAFBCDKLWESTSURF=SN ! Western surface of baffle sections B, C, D, K,
& L.  SURFTYPESPEC(SN)='PX'
      SURFVALUESPEC(SN)=(-1.0*(ASSYPITCH/2.0))+
      c  BAFFLESEPARATION
      SN=SN+1
      BAFHIJKLNORTHSURF=SN ! Nothern surface of baffle sections H, I, J,
K, & L.  SURFTYPESPEC(SN)='PY'
      SURFVALUESPEC(SN)=(ASSYPITCH/2.0)-
      c  BAFFLESEPARATION
      SN=SN+1
      BAFHIJKLSOUTHSURF=SN ! Southern surface of baffle sections H, I, J,
K, & L.  SURFTYPESPEC(SN)='PY'
      SURFVALUESPEC(SN)=(ASSYPITCH/2.0)-
      c  (BAFFLESEPARATION+BAFFLETHICKNESS)
      SN=SN+1
      BAFEFIJJEASTSURF=SN ! Eastern surface of baffle sections E, F, G, I,
& J.  SURFTYPESPEC(SN)='PX'
      SURFVALUESPEC(SN)=(ASSYPITCH/2.0)-
      c  BAFFLESEPARATION
      SN=SN+1
      BAFEFIJWESTSURF=SN ! Western surface of baffle sections E, F, G, I,
& J.  SURFTYPESPEC(SN)='PX'
      SURFVALUESPEC(SN)=(ASSYPITCH/2.0)-
      c  (BAFFLESEPARATION+BAFFLETHICKNESS)
      SN=SN+1

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 177 of 647

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      BAFFLEML=MN
*   Check Core Baffle
      DO 843 C=1,BAFFLEISONUM
        IF (C.EQ.1) THEN
          WRITE(200,841) BAFFLEML, BAFFLEZAIDS(C),
            c      (-1*BAFFLEWTS(C))
          841     FORMAT(T1, 'M', I4, T9, A9, 3X, G14.6,
            c      ' $ Core Baffle')
          ELSE
            WRITE(200,842) BAFFLEZAIDS(C), (-1*BAFFLEWTS(C))
          842     FORMAT(T9, A9, 3X, G14.6)
          ENDIF
          843     CONTINUE
          MN=MN+1
*   Write universe for baffle section A.
          WRITE(30,850) LN, BMODML, (-1*MODDENSITY), BAFACDFGNORTHSURF,
            c      BAFQ1P1UNIV
          850     FORMAT(T1, I4, T6, I4, T11, F7.4, T25, I4, ' IMP:N=1 U=', I2)
          LN=LN+1
          WRITE(30,860) LN, BMODML, (-1*MODDENSITY),
            c      (-1*BAFACDFGSOUTHSURF), BAFQ1P1UNIV
          860     FORMAT(T1, I4, T6, I4, T11, F7.4, T25, I4, ' IMP:N=1 U=', I2)
          LN=LN+1
          WRITE(30,870) LN, BAFFLEML, (-1*BAFFLEDENSITY),
            c      (-1*BAFACDFGNORTHSURF), BAFACDFGSOUTHSURF, BAFQ1P1UNIV
          870     FORMAT(T1, I4, T6, I4, T11, F7.4, T25, I4, 1X, I4, ' IMP:N=1 U=', I2)
          LN=LN+1
*   Write universe for baffle section B.
          WRITE(30,880) LN, BMODML, (-1*MODDENSITY), BAFBCDKLEASTSURF,
            c      BAFQ1P2UNIV
          880     FORMAT(T1, I4, T6, I4, T11, F7.4, T25, I4, ' IMP:N=1 U=', I2)
          LN=LN+1
          WRITE(30,890) LN, BMODML, (-1*MODDENSITY),
            c      (-1*BAFBCDKLWESTSURF), BAFQ1P2UNIV
          890     FORMAT(T1, I4, T6, I4, T11, F7.4, T25, I4, ' IMP:N=1 U=', I2)
          LN=LN+1
          WRITE(30,900) LN, BAFFLEML, (-1*BAFFLEDENSITY),
            c      (-1*BAFBCDKLEASTSURF), BAFBCDKLWESTSURF, BAFQ1P2UNIV
          900     FORMAT(T1, I4, T6, I4, T11, F7.4, T25, I4, 1X, I4, ' IMP:N=1 U=', I2)
          LN=LN+1
*   Write universe for baffle section C.
          WRITE(30,910) LN, BMODML, (-1*MODDENSITY), BAFBCDKLEASTSURF,
            c      BAFACDFGNORTHSURF, BAFQ1P3UNIV
          910     FORMAT(T1, I4, T6, I4, T11, F7.4, T25, I4, 1X, I4, ' IMP:N=1 U=', I2)
          LN=LN+1
          WRITE(30,920) LN, BMODML, (-1*MODDENSITY),
            c      (-1*BAFBCDKLWESTSURF), (-1*BAFACDFGSOUTHSURF), BAFQ1P3UNIV
          920     FORMAT(T1, I4, T6, I4, T11, F7.4, T25, I4, ':', I4, ' IMP:N=1 U=', I2)
          LN=LN+1
          WRITE(30,930) LN, BAFFLEML, (-1*BAFFLEDENSITY),
            c      (-1*BAFBCDKLEASTSURF), (-1*BAFACDFGNORTHSURF),
            c      BAFBCDKLWESTSURF, BAFACDFGSOUTHSURF, BAFQ1P3UNIV
          930     FORMAT(T1, I4, T6, I4, T11, F7.4, T25, '(', I4, ':', I4, ') (' , I4, 1X, I4,
            c      ') IMP:N=1 U=', I2)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 178 of 647

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LN=LN+1
* Write universe for baffle section D.
  WRITE(30,940) LN, BMODML, (-1*MODDENSITY), BAFBCDKLEASTSURF,
  c BAFACDFGNORTHSURF, BAFQ1P4UNIV
940  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,':',I4,' IMP:N=1 U=',I2)
  LN=LN+1
  WRITE(30,950) LN, BMODML, (-1*MODDENSITY),
  c (-1*BAFBCDKLWESTSURF), (-1*BAFACDFGSOUTHSURF), BAFQ1P4UNIV
950  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,1X,I4,' IMP:N=1 U=',I2)
  LN=LN+1
  WRITE(30,960) LN, BAFFLEML, (-1*BAFFLEDENSITY),
  c (-1*BAFBCDKLEASTSURF), (-1*BAFACDFGNORTHSURF),
  c BAFBCDKLWESTSURF, BAFACDFGSOUTHSURF, BAFQ1P4UNIV
960  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,(' ',I4,1X,I4,') (' ',I4,':',I4,
  c ') IMP:N=1 U=',I2)
  LN=LN+1
* Write universe for baffle section E.
  WRITE(30,970) LN, BMODML, (-1*MODDENSITY), BAFEFGIJEASTSURF,
  c BAFQ2P2UNIV
970  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,' IMP:N=1 U=',I2)
  LN=LN+1
  WRITE(30,980) LN, BMODML, (-1*MODDENSITY),
  c (-1*BAFEFGIJWESTSURF), BAFQ2P2UNIV
980  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,' IMP:N=1 U=',I2)
  LN=LN+1
  WRITE(30,990) LN, BAFFLEML, (-1*BAFFLEDENSITY),
  c (-1*BAFEFGIJEASTSURF), BAFEFGIJWESTSURF, BAFQ2P2UNIV
990  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,1X,I4,' IMP:N=1 U=',I2)
  LN=LN+1
* Write universe for baffle section F.
  WRITE(30,1000) LN, BMODML, (-1*MODDENSITY),
  c (-1*BAFEFGIJWESTSURF), BAFACDFGNORTHSURF, BAFQ2P3UNIV
1000  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,1X,I4,' IMP:N=1 U=',I2)
  LN=LN+1
  WRITE(30,1010) LN, BMODML, (-1*MODDENSITY), BAFEFGIJEASTSURF,
  c (-1*BAFACDFGSOUTHSURF), BAFQ2P3UNIV
1010  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,':',I4,' IMP:N=1 U=',I2)
  LN=LN+1
  WRITE(30,1020) LN, BAFFLEML, (-1*BAFFLEDENSITY),
  c BAFEFGIJWESTSURF, (-1*BAFACDFGNORTHSURF),
  c (-1*BAFEFGIJEASTSURF), BAFACDFGSOUTHSURF, BAFQ2P3UNIV
1020  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,(' ',I4,':',I4,') (' ',I4,1X,I4,
  c ') IMP:N=1 U=',I2)
  LN=LN+1
* Write universe for baffle section G.
  WRITE(30,1030) LN, BMODML, (-1*MODDENSITY),
  c (-1*BAFEFGIJWESTSURF), BAFACDFGNORTHSURF, BAFQ2P4UNIV
1030  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,':',I4,' IMP:N=1 U=',I2)
  LN=LN+1
  WRITE(30,1040) LN, BMODML, (-1*MODDENSITY), BAFEFGIJEASTSURF,
  c (-1*BAFACDFGSOUTHSURF), BAFQ2P4UNIV
1040  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,1X,I4,' IMP:N=1 U=',I2)
  LN=LN+1
  WRITE(30,1050) LN, BAFFLEML, (-1*BAFFLEDENSITY),
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 179 of 647

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c  BAFEFGIJWESTSURF, (-1*BAFACDFGNORTHSURF),
c  (-1*BAFEFGIJEASTSURF), BAFACDFGSOUTHSURF, BAFQ2P4UNIV
1050  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,'(,I4,1X,I4,') (' ,I4,':',I4,
c  ') IMP:N=1 U=',I2)
      LN=LN+1
*  Write universe for baffle section H.
      WRITE(30,1060) LN, BMODML, (-1*MODDENSITY), BAFHIJKLNORTHSURF,
c  BAFQ3P1UNIV
1060  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,' IMP:N=1 U=',I2)
      LN=LN+1
      WRITE(30,1070) LN, BMODML, (-1*MODDENSITY),
c  (-1*BAFHIJKLSOUTHSURF), BAFQ3P1UNIV
1070  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,' IMP:N=1 U=',I2)
      LN=LN+1
      WRITE(30,1080) LN, BAFFLEML, (-1*BAFFLEDENSITY),
c  (-1*BAFHIJKLNORTHSURF), BAFHIJKLSOUTHSURF, BAFQ3P1UNIV
1080  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,1X,I4,' IMP:N=1 U=',I2)
      LN=LN+1
*  Write universe for baffle section I.
      WRITE(30,1090) LN, BMODML, (-1*MODDENSITY),
c  (-1*BAFEFGIJWESTSURF), (-1*BAFHIJKLSOUTHSURF), BAFQ3P3UNIV
1090  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,1X,I4,' IMP:N=1 U=',I2)
      LN=LN+1
      WRITE(30,1100) LN, BMODML, (-1*MODDENSITY), BAFEFGIJEASTSURF,
c  BAFHIJKLNORTHSURF, BAFQ3P3UNIV
1100  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,':',I4,' IMP:N=1 U=',I2)
      LN=LN+1
      WRITE(30,1110) LN, BAFFLEML, (-1*BAFFLEDENSITY),
c  BAFEFGIJWESTSURF, BAFHIJKLSOUTHSURF, (-1*BAFEFGIJEASTSURF),
c  (-1*BAFHIJKLNORTHSURF), BAFQ3P3UNIV
1110  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,'(,I4,':',I4,') (' ,I4,1X,I4,
c  ') IMP:N=1 U=',I2)
      LN=LN+1
*  Write universe for baffle section J.
      WRITE(30,1120) LN, BMODML, (-1*MODDENSITY),
c  (-1*BAFEFGIJWESTSURF), (-1*BAFHIJKLSOUTHSURF), BAFQ3P4UNIV
1120  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,':',I4,' IMP:N=1 U=',I2)
      LN=LN+1
      WRITE(30,1130) LN, BMODML, (-1*MODDENSITY), BAFEFGIJEASTSURF,
c  BAFHIJKLNORTHSURF, BAFQ3P4UNIV
1130  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,1X,I4,' IMP:N=1 U=',I2)
      LN=LN+1
      WRITE(30,1140) LN, BAFFLEML, (-1*BAFFLEDENSITY),
c  BAFEFGIJWESTSURF, BAFHIJKLSOUTHSURF, (-1*BAFEFGIJEASTSURF),
c  (-1*BAFHIJKLNORTHSURF), BAFQ3P4UNIV
1140  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,'(,I4,1X,I4,') (' ,I4,':',I4,
c  ') IMP:N=1 U=',I2)
      LN=LN+1
*  Write universe for baffle section K.
      WRITE(30,1150) LN, BMODML, (-1*MODDENSITY), BAFBCDKLEASTSURF,
c  (-1*BAFHIJKLSOUTHSURF), BAFQ4P3UNIV
1150  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,1X,I4,' IMP:N=1 U=',I2)
      LN=LN+1
      WRITE(30,1160) LN, BMODML, (-1*MODDENSITY),

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 180 of 647

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      c  (-1*BAFBCDKLWESTSURF), BAFHIJKLNORTHSURF, BAFQ4P3UNIV
1160  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,':',I4,' IMP:N=1 U=',I2)
      LN=LN+1
      WRITE(30,1170) LN, BAFFLEML, (-1*BAFFLEDENSITY),
      c  (-1*BAFBCDKLEASTSURF), BAFHIJKLSOUTHSURF, BAFBCDKLWESTSURF,
      c  (-1*BAFHIJKLNORTHSURF), BAFQ4P3UNIV
1170  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,'(',I4,':',I4,') (' ,I4,1X,I4,
      c  ') IMP:N=1 U=',I2)
      LN=LN+1
*      Write universe for baffle section L.
      WRITE(30,1180) LN, BMODML, (-1*MODDENSITY), BAFBCDKLEASTSURF,
      c  (-1*BAFHIJKLSOUTHSURF), BAFQ4P4UNIV
1180  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,':',I4,' IMP:N=1 U=',I2)
      LN=LN+1
      WRITE(30,1190) LN, BMODML, (-1*MODDENSITY),
      c  (-1*BAFBCDKLWESTSURF), BAFHIJKLNORTHSURF, BAFQ4P4UNIV
1190  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,1X,I4,' IMP:N=1 U=',I2)
      LN=LN+1
      WRITE(30,1200) LN, BAFFLEML, (-1*BAFFLEDENSITY),
      c  (-1*BAFBCDKLEASTSURF), BAFHIJKLSOUTHSURF, BAFBCDKLWESTSURF,
      c  (-1*BAFHIJKLNORTHSURF), BAFQ4P4UNIV
1200  FORMAT(T1,I4,T6,I4,T11,F7.4,T25,'(',I4,1X,I4,') (' ,I4,':',I4,
      c  ') IMP:N=1 U=',I2)
      LN=LN+1
      ENDIF
      DO 1202 C=1,NUMOFFADESIGNS
        COMBOFLAG(C)=.FALSE.
1202  CONTINUE
*      Write the specifications for the fuel assembly lattices.
      WRITE(30,1210)
1210  FORMAT(T1,'C')
      WRITE(30,1220)
1220  FORMAT(T1,'C  FUEL ASSEMBLY LATTICE SPECIFICATIONS')
      WRITE(30,1230)
1230  FORMAT(T1,'C')
*
*
      FRUN=400
      CRUN=700
      BPRUN=800
      APSRUN=900
      GTUN=1000
      ITUN=1100
      DO 1234 COLUMN=1,50
        DO 1232 ROW=1,50
          FRUNIV(COLUMN,ROW)=0
          GTUNIV(COLUMN,ROW)=0
          ITUNIV(COLUMN,ROW)=0
          CRAUNIV(COLUMN,ROW)=0
          BPRAUNIV(COLUMN,ROW)=0
          APSRAUNIV(COLUMN,ROW)=0
          GTWRITE(COLUMN,ROW)=.FALSE.
1232  CONTINUE
1234  CONTINUE

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Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 181 of 647

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DO 1900 ROW=1,50
DO 1890 COLUMN=1,50
  IF (ASSYID(COLUMN,ROW).NE.' ') THEN
* Determine if the fuel composition in the assembly is unique.
* Assign the appropriate universe id to the fuel rods in the assembly.
  FUNIQUE(COLUMN,ROW)=.TRUE.
  LEAVE=.FALSE.
  IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
    DO 1237 RO=1,(ROW-1)
    DO 1236 CO=1,50
      IF (ASSYID(COLUMN,ROW).EQ.ASSYID(CO,RO)) THEN
        FUNIQUE(COLUMN,ROW)=.FALSE.
        LEAVE=.TRUE.
        FRUNIV(COLUMN,ROW)=FRUNIV(CO,RO)
        EXIT
      ENDIF
1236 CONTINUE
      IF (LEAVE.EQ..TRUE.) THEN
        EXIT
      ENDIF
1237 CONTINUE
      IF (LEAVE.EQ..FALSE.) THEN
        DO 1239 RO=ROW,ROW
        DO 1238 CO=1,(COLUMN-1)
          IF (ASSYID(COLUMN,ROW).EQ.ASSYID(CO,RO)) THEN
            FUNIQUE(COLUMN,ROW)=.FALSE.
            LEAVE=.TRUE.
            FRUNIV(COLUMN,ROW)=FRUNIV(CO,RO)
            EXIT
          ENDIF
1238 CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
1239 CONTINUE
        ENDIF
      ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
        DO 1241 RO=1,(ROW-1)
        DO 1240 CO=1,50
          IF (ASSYID(COLUMN,ROW).EQ.ASSYID(CO,RO)) THEN
            FUNIQUE(COLUMN,ROW)=.FALSE.
            LEAVE=.TRUE.
            FRUNIV(COLUMN,ROW)=FRUNIV(CO,RO)
            EXIT
          ENDIF
1240 CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
1241 CONTINUE
        ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
          DO 1243 RO=1,1
          DO 1242 CO=1,(COLUMN-1)
            IF (ASSYID(COLUMN,ROW).EQ.ASSYID(CO,RO)) THEN
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 182 of 647

```

                FUNIQUE (COLUMN, ROW) = .FALSE.
                LEAVE = .TRUE.
                FRUNIV (COLUMN, ROW) = FRUNIV (CO, RO)
                EXIT
            ENDIF
1242          CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                    EXIT
                ENDIF
1243          CONTINUE
            ENDIF
            IF (FUNIQUE (COLUMN, ROW) .EQ..TRUE.) THEN
                FRUNIV (COLUMN, ROW) = FRUN
                FRUN = FRUN + 1
            ENDIF
* Determine if the assembly has a unique BPRA inserted.
            BPRUNIQUE (COLUMN, ROW) = .FALSE.
            IF (BANKNUM (COLUMN, ROW) .NE. 0) THEN
                IF (FUNIQUE (COLUMN, ROW) .EQ..TRUE.) THEN
                    IF (BANKDES (BANKNUM (COLUMN, ROW)) .EQ. 'BPRA ') THEN
                        BPRUNIQUE (COLUMN, ROW) = .TRUE.
                        BPRAUNIV (COLUMN, ROW) = BPRUN
                        BPRUN = BPRUN + 1
                    ENDIF
                ELSEIF ((FUNIQUE (COLUMN, ROW) .EQ..FALSE.) .AND.
c              (BANKDES (BANKNUM (COLUMN, ROW)) .EQ. 'BPRA ')) THEN
                    BPRUNIQUE (COLUMN, ROW) = .TRUE.
                    LEAVE = .FALSE.
                    IF (COLUMN .NE. 1) THEN
                        DO 1245 RO = 1, (ROW - 1)
                            DO 1244 CO = 1, 50
                                IF ((ASSYID (COLUMN, ROW) .NE. ' ') .AND.
c              (ASSYID (COLUMN, ROW) .EQ. ASSYID (CO, RO)) .AND.
c              (BANKNUM (COLUMN, ROW) .EQ. BANKNUM (CO, RO))) THEN
                                    BPRUNIQUE (COLUMN, ROW) = .FALSE.
                                    LEAVE = .TRUE.
                                    BPRAUNIV (COLUMN, ROW) = BPRAUNIV (CO, RO)
                                    EXIT
                                ENDIF
                            ENDIF
1244          CONTINUE
                                IF (LEAVE.EQ..TRUE.) THEN
                                    EXIT
                                ENDIF
1245          CONTINUE
                                IF (LEAVE.EQ..FALSE.) THEN
                                    DO 1247 RO = ROW, ROW
                                        DO 1246 CO = 1, (COLUMN - 1)
                                            IF ((ASSYID (COLUMN, ROW) .NE. ' ') .AND.
c              (ASSYID (COLUMN, ROW) .EQ. ASSYID (CO, RO)) .AND.
c              (BANKNUM (COLUMN, ROW) .EQ. BANKNUM (CO, RO))) THEN
                                                BPRUNIQUE (COLUMN, ROW) = .FALSE.
                                                LEAVE = .TRUE.
                                                BPRAUNIV (COLUMN, ROW) = BPRAUNIV (CO, RO)
                                                EXIT
                                            ENDIF
                                        ENDIF
                                    ENDIF
                                ENDIF

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 183 of 647

```

                ENDIF
1246             CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                    EXIT
                ENDIF
1247             CONTINUE
                ENDIF
                ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
                    DO 1249 RO=1,(ROW-1)
                    DO 1248 CO=1,50
                        IF ((ASSYID(COLUMN,ROW).NE.'      ').AND.
c                 (ASSYID(COLUMN,ROW).EQ.ASSYID(CO,RO)).AND.
c                 (BANKNUM(COLUMN,ROW).EQ.BANKNUM(CO,RO))) THEN
                            BPRUNIQUE(COLUMN,ROW)=.FALSE.
                            LEAVE=.TRUE.
                            BPRAUNIV(COLUMN,ROW)=BPRAUNIV(CO,RO)
                            EXIT
                        ENDIF
1248             CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                    EXIT
                ENDIF
1249             CONTINUE
                ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
                    DO 1251 RO=1,1
                    DO 1250 CO=1,(COLUMN-1)
                        IF ((ASSYID(COLUMN,ROW).NE.'      ').AND.
c                 (ASSYID(COLUMN,ROW).EQ.ASSYID(CO,RO)).AND.
c                 (BANKNUM(COLUMN,ROW).EQ.BANKNUM(CO,RO))) THEN
                            BPRUNIQUE(COLUMN,ROW)=.FALSE.
                            LEAVE=.TRUE.
                            BPRAUNIV(COLUMN,ROW)=BPRAUNIV(CO,RO)
                            EXIT
                        ENDIF
1250             CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                    EXIT
                ENDIF
1251             CONTINUE
                ENDIF
                IF (BPRUNIQUE(COLUMN,ROW).EQ..TRUE.) THEN
                    BPRAUNIV(COLUMN,ROW)=BPRUN
                    BPRUN=BPRUN+1
                ENDIF
            ENDIF
        ENDIF
    ENDIF
* Determine if the assembly design is unique.
* If the assembly design is unique, additional GT and IT universes will be
defined.
    DUNIQUE(COLUMN,ROW)=.TRUE.
    LEAVE=.FALSE.
    IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
        DO 1253 RO=1,(ROW-1)
        DO 1252 CO=1,50

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 184 of 647

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                IF (DESNUM(COLUMN,ROW).EQ.DESNUM(CO,RO)) THEN
                    DUNIQUE(COLUMN,ROW)=.FALSE.
                    ITUNIV(COLUMN,ROW)=ITUNIV(CO,RO)
                    LEAVE=.TRUE.
                    EXIT
                ENDIF
1252          CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                    EXIT
                ENDIF
1253          CONTINUE
                IF (LEAVE.EQ..FALSE.) THEN
                    DO 1255 RO=ROW,ROW
                        DO 1254 CO=1,(COLUMN-1)
                            IF (DESNUM(COLUMN,ROW).EQ.DESNUM(CO,RO)) THEN
                                DUNIQUE(COLUMN,ROW)=.FALSE.
                                ITUNIV(COLUMN,ROW)=ITUNIV(CO,RO)
                                LEAVE=.TRUE.
                                EXIT
                            ENDIF
1254          CONTINUE
                            IF (LEAVE.EQ..TRUE.) THEN
                                EXIT
                            ENDIF
1255          CONTINUE
                        ENDIF
                    ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
                        DO 1257 RO=1,(ROW-1)
                            DO 1256 CO=1,50
                                IF (DESNUM(COLUMN,ROW).EQ.DESNUM(CO,RO)) THEN
                                    DUNIQUE(COLUMN,ROW)=.FALSE.
                                    ITUNIV(COLUMN,ROW)=ITUNIV(CO,RO)
                                    LEAVE=.TRUE.
                                    EXIT
                                ENDIF
1256          CONTINUE
                                IF (LEAVE.EQ..TRUE.) THEN
                                    EXIT
                                ENDIF
1257          CONTINUE
                            ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
                                DO 1259 RO=1,1
                                    DO 1258 CO=1,(COLUMN-1)
                                        IF (DESNUM(COLUMN,ROW).EQ.DESNUM(CO,RO)) THEN
                                            DUNIQUE(COLUMN,ROW)=.FALSE.
                                            ITUNIV(COLUMN,ROW)=ITUNIV(CO,RO)
                                            LEAVE=.TRUE.
                                            EXIT
                                        ENDIF
1258          CONTINUE
                                        IF (LEAVE.EQ..TRUE.) THEN
                                            EXIT
                                        ENDIF
1259          CONTINUE
                                    ENDIF
                                CONTINUE
                            ENDIF
                        ENDIF
                    ENDIF
                ENDIF
            ENDIF
        ENDIF
    ENDIF
END
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 185 of 647

```

ENDIF
IF (BANKNUM(COLUMN,ROW).EQ.0) THEN
  IF (COMBOFLAG(DESNUM(COLUMN,ROW)).EQ..FALSE.) THEN
    COMBOFLAG(DESNUM(COLUMN,ROW))=.TRUE.
    GTUNIV(COLUMN,ROW)=GTUN
    GTWRITE(COLUMN,ROW)=.TRUE.
    COMBOVAL(DESNUM(COLUMN,ROW))=GTUN
    GTUN=GTUN+1
  ELSEIF (COMBOFLAG(DESNUM(COLUMN,ROW)).EQ..TRUE.) THEN
    GTUNIV(COLUMN,ROW)=COMBOVAL(DESNUM(COLUMN,ROW))
  ENDIF
ENDIF
ELSEIF (WESTINGHOUSE.EQ..TRUE.) THEN
  IF ((WBPRATYPE(BANKNUM(COLUMN,ROW)).EQ.1).OR.
    c (WBPRATYPE(BANKNUM(COLUMN,ROW)).EQ.2).OR.
    c (WBPRATYPE(BANKNUM(COLUMN,ROW)).EQ.3).OR.
    c (WBPRATYPE(BANKNUM(COLUMN,ROW)).EQ.4).OR.
    c (WBPRATYPE(BANKNUM(COLUMN,ROW)).EQ.5).OR.
    c (WBPRATYPE(BANKNUM(COLUMN,ROW)).EQ.6).OR.
    c (WBPRATYPE(BANKNUM(COLUMN,ROW)).EQ.7)) THEN
    IF (COMBOFLAG(DESNUM(COLUMN,ROW)).EQ.
    c .FALSE.) THEN
      COMBOFLAG(DESNUM(COLUMN,ROW))=.TRUE.
      GTUNIV(COLUMN,ROW)=GTUN
      GTWRITE(COLUMN,ROW)=.TRUE.
      COMBOVAL(DESNUM(COLUMN,ROW))=GTUN
      GTUN=GTUN+1
    ELSEIF (COMBOFLAG(DESNUM(COLUMN,ROW))
    c .EQ..TRUE.) THEN
      GTUNIV(COLUMN,ROW)=
    c COMBOVAL(DESNUM(COLUMN,ROW))
    ENDIF
  ENDIF
ENDIF
ENDIF
IF (DUNIQUE(COLUMN,ROW).EQ..TRUE.) THEN
  ITUNIV(COLUMN,ROW)=ITUN
  ITUN=ITUN+1
ENDIF

```

* Determine if the assembly has a unique CRA inserted.

* If the assembly contains a unique CRA, give the CRA an appropriate universe id.

```

CRUNIQUE(COLUMN,ROW)=.FALSE.
IF (BANKNUM(COLUMN,ROW).NE.0) THEN
  IF ((DUNIQUE(COLUMN,ROW).EQ..TRUE.).AND.
    c (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'CRA ')) THEN
    CRUNIQUE(COLUMN,ROW)=.TRUE.
    CRAUNIV(COLUMN,ROW)=CRUN
    CRUN=CRUN+1
  ELSEIF ((DUNIQUE(COLUMN,ROW).EQ..FALSE.).AND.
    c (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'CRA ')) THEN
    CRUNIQUE(COLUMN,ROW)=.TRUE.
    LEAVE=.FALSE.
  IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
    DO 1261 RO=1,(ROW-1)
    DO 1260 CO=1,50

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 186 of 647

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                IF (DESNUM(COLUMN,ROW) .EQ. DESNUM(CO,RO)) THEN
                    CRUNIQUE(COLUMN,ROW) = .FALSE.
                    LEAVE = .TRUE.
                    CRAUNIV(COLUMN,ROW) = CRAUNIV(CO,RO)
                    EXIT
                ENDIF
1260          CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                    EXIT
                ENDIF
1261          CONTINUE
                IF (LEAVE.EQ..FALSE.) THEN
                    DO 1264 RO=ROW,ROW
                        DO 1263 CO=1,(COLUMN-1)
                            IF (DESNUM(COLUMN,ROW) .EQ.
                                DESNUM(CO,RO)) THEN
                                CRUNIQUE(COLUMN,ROW) = .FALSE.
                                LEAVE = .TRUE.
                                CRAUNIV(COLUMN,ROW) = CRAUNIV(CO,RO)
                                EXIT
                            ENDIF
1263          CONTINUE
                            IF (LEAVE.EQ..TRUE.) THEN
                                EXIT
                            ENDIF
1264          CONTINUE
                        ENDIF
                    ELSEIF ((COLUMN.EQ.1) .AND. (ROW.NE.1)) THEN
                        DO 1266 RO=1,(ROW-1)
                            DO 1265 CO=1,50
                                IF (DESNUM(COLUMN,ROW) .EQ. DESNUM(CO,RO)) THEN
                                    CRUNIQUE(COLUMN,ROW) = .FALSE.
                                    LEAVE = .TRUE.
                                    CRAUNIV(COLUMN,ROW) = CRAUNIV(CO,RO)
                                    EXIT
                                ENDIF
1265          CONTINUE
                                IF (LEAVE.EQ..TRUE.) THEN
                                    EXIT
                                ENDIF
1266          CONTINUE
                            ELSEIF ((ROW.EQ.1) .AND. (COLUMN.NE.1)) THEN
                                DO 1268 RO=1,1
                                    DO 1267 CO=1,(COLUMN-1)
                                        IF (DESNUM(COLUMN,ROW) .EQ. DESNUM(CO,RO)) THEN
                                            CRUNIQUE(COLUMN,ROW) = .FALSE.
                                            LEAVE = .TRUE.
                                            CRAUNIV(COLUMN,ROW) = CRAUNIV(CO,RO)
                                            EXIT
                                        ENDIF
1267          CONTINUE
                                        IF (LEAVE.EQ..TRUE.) THEN
                                            EXIT
                                        ENDIF

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 187 of 647

```

1268          CONTINUE
              ENDIF
              IF (CRUNIQUE(COLUMN,ROW).EQ..TRUE.) THEN
                  CRAUNIV(COLUMN,ROW)=CRUN
                  CRUN=CRUN+1
              ENDIF
          ENDIF
      ENDIF
* Determine if the assembly has a unique APSRA inserted.
* If the assembly contains a unique APSRA, give the APSRA an appropriate
  universe id.
      APSRUNIQUE(COLUMN,ROW)=.FALSE.
      IF (BANKNUM(COLUMN,ROW).NE.0) THEN
          IF ((DUNIQUE(COLUMN,ROW).EQ..TRUE.).AND.
c          (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'APSRA')) THEN
              IF (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'APSRA') THEN
                  APSRUNIQUE(COLUMN,ROW)=.TRUE.
                  APSRAUNIV(COLUMN,ROW)=APSRUN
                  APSRUN=APSRUN+1
              ENDIF
c          ELSEIF ((DUNIQUE(COLUMN,ROW).EQ..FALSE.).AND.
                  (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'APSRA')) THEN
                  APSRUNIQUE(COLUMN,ROW)=.TRUE.
                  LEAVE=.FALSE.
                  IF (COLUMN.NE.1) THEN
                      DO 1270 RO=1,(ROW-1)
                          DO 1269 CO=1,50
                              IF (DESNUM(COLUMN,ROW).EQ.DESNUM(CO,RO)) THEN
                                  APSRUNIQUE(COLUMN,ROW)=.FALSE.
                                  LEAVE=.TRUE.
                                  APSRAUNIV(COLUMN,ROW)=APSRAUNIV(CO,RO)
                                  EXIT
                              ENDIF
1269          CONTINUE
                  IF (LEAVE.EQ..TRUE.) THEN
                      EXIT
                  ENDIF
1270          CONTINUE
                  IF (LEAVE.EQ..FALSE.) THEN
                      DO 1272 RO=ROW,ROW
                          DO 1271 CO=1,(COLUMN-1)
                              IF (DESNUM(COLUMN,ROW).EQ.
c                              DESNUM(CO,RO)) THEN
                                  APSRUNIQUE(COLUMN,ROW)=.FALSE.
                                  LEAVE=.TRUE.
                                  APSRAUNIV(COLUMN,ROW)=APSRAUNIV(CO,RO)
                                  EXIT
                              ENDIF
1271          CONTINUE
                  IF (LEAVE.EQ..TRUE.) THEN
                      EXIT
                  ENDIF
1272          CONTINUE
      ENDIF

```

```

ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
  DO 1274 RO=1,(ROW-1)
    DO 1273 CO=1,50
      IF (DESNUM(COLUMN,ROW).EQ.DESNUM(CO,RO)) THEN
        APSRUNIQUE(COLUMN,ROW)=.FALSE.
        LEAVE=.TRUE.
        APSRAUNIV(COLUMN,ROW)=APSRUNIV(CO,RO)
        EXIT
      ENDIF
1273 CONTINUE
      IF (LEAVE.EQ..TRUE.) THEN
        EXIT
      ENDIF
1274 CONTINUE
ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
  DO 1276 RO=1,1
    DO 1275 CO=1,(COLUMN-1)
      IF (DESNUM(COLUMN,ROW).EQ.DESNUM(CO,RO)) THEN
        APSRUNIQUE(COLUMN,ROW)=.FALSE.
        LEAVE=.TRUE.
        APSRAUNIV(COLUMN,ROW)=APSRUNIV(CO,RO)
        EXIT
      ENDIF
1275 CONTINUE
      IF (LEAVE.EQ..TRUE.) THEN
        EXIT
      ENDIF
1276 CONTINUE
    ENDIF
  ENDIF
  IF (APSRUNIQUE(COLUMN,ROW).EQ..TRUE.) THEN
    APSRAUNIV(COLUMN,ROW)=APSRUN
    APSRUN=APSRUN+1
  ENDIF
ENDIF
ENDIF
ENDIF
* Write the assembly layout specification if any of the following are true:
* FUNIQUE(COLUMN,ROW)=.TRUE., DUNIQUE(COLUMN,ROW)=.TRUE.,
BPRUNIQUE(COLUMN,ROW)=.TRUE.,
* CRUNIQUE(COLUMN,ROW)=.TRUE., APSRUNIQUE(COLUMN,ROW)=.TRUE.
  IF ((FUNIQUE(COLUMN,ROW).EQ..TRUE.)
    c .OR.(DUNIQUE(COLUMN,ROW).EQ..TRUE.)
    c .OR.(BPRUNIQUE(COLUMN,ROW).EQ..TRUE.)
    c .OR.(CRUNIQUE(COLUMN,ROW).EQ..TRUE.)
    c .OR.(APSRUNIQUE(COLUMN,ROW).EQ..TRUE.)) THEN
* Write the header for the assembly layout specification.
  IF (BANKNUM(COLUMN,ROW).NE.0) THEN
  IF (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'BPRA ') THEN
    WRITE(30,1277) ASSYID(COLUMN,ROW)
1277 FORMAT(T1,'C ASSEMBLY ',A5,' LAYOUT WITH ',
    c 'BPRA INSERTED')
  ELSEIF (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'CRA ') THEN
    WRITE(30,1278) ASSYID(COLUMN,ROW)
1278 FORMAT(T1,'C ASSEMBLY ',A5,' LAYOUT WITH ',
    c 'CRA INSERTED')

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 189 of 647

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ELSEIF (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'APSRA') THEN
  WRITE(30,1280) ASSYID(COLUMN,ROW)
1280   FORMAT(T1,'C ASSEMBLY ',A5,' LAYOUT WITH ',
      c     'APSRA INSERTED')
      ENDIF
      ENDIF
      IF (BANKNUM(COLUMN,ROW).EQ.0) THEN
        WRITE(30,1282) ASSYID(COLUMN,ROW)
1282   FORMAT(T1,'C ASSEMBLY ',A5,' LAYOUT WITH ',
      c     'NO RODDED INSERTION ASSEMBLY')
      ENDIF
* Define the pin pitch surfaces.
      IF (DESNUM(COLUMN,ROW).NE.0) THEN
        DNUM=DESNUM(COLUMN,ROW)
        PITCH=PINPITCH(DNUM)
        ENDIF
        VAL5=(PITCH/2.0)
        DO 1284 SURFNUM=1,SN-1
          IF ((SURFTYPESPEC(SURFNUM).EQ.'PY').AND.
      c     (SURFVALUESPEC(SURFNUM).EQ.VAL5)) THEN
            PITCHNORTH=SURFNUM ! Northern surface of unit pin cell
            PITCHSOUTH=SURFNUM+1 ! Southern surface of unit pin cell
            PITCHEAST=SURFNUM+2 ! Eastern surface of unit pin cell
            PITCHWEST=SURFNUM+3 ! Western surface of unit pin cell
            IF (SURFNUM.NE.(SN-1)) THEN
              EXIT
            ENDIF
            ELSEIF(SURFNUM.EQ.(SN-1)) THEN
              PITCHNORTH=SN ! Northern surface of unit pin cell
              SURFTYPESPEC(SN)='PY'
              SURFVALUESPEC(SN)=(PITCH/2.0)
              SN=SN+1
              PITCHSOUTH=SN ! Southern surface of unit pin cell
              SURFTYPESPEC(SN)='PY'
              SURFVALUESPEC(SN)=(-1*(PITCH/2.0))
              SN=SN+1
              PITCHEAST=SN ! Eastern surface of unit pin cell
              SURFTYPESPEC(SN)='PX'
              SURFVALUESPEC(SN)=(PITCH/2.0)
              SN=SN+1
              PITCHWEST=SN ! Western surface of unit pin cell
              SURFTYPESPEC(SN)='PX'
              SURFVALUESPEC(SN)=(-1*(PITCH/2.0))
              SN=SN+1
            ENDIF
1284   CONTINUE
* Write the basic assembly layout specification cards.
      WRITE(30,1286) LN, BMODML, (-1*MODDENSITY),
      c     (-1*PITCHEAST), PITCHWEST, (-1*PITCHNORTH),
      c     PITCHSOUTH, ASSYUNIV(COLUMN,ROW)
1286   FORMAT(T1,I4,T6,I4,T11,F7.4,T25,I4,1X,I4,1X,I4,1X,I4,
      c     ' IMP:N=1 LAT=1 U=',I3)
      LN=LN+1
      IF (BANDW.EQ..TRUE.) THEN

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Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 190 of 647

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        WRITE(30,1288)
1288      FORMAT(T11,'FILL -9:9 -9:9 0:0')
        ELSEIF (WESTINGHOUSE.EQ..TRUE.) THEN
        WRITE(30,1290)
1290      FORMAT(T11,'FILL -10:10 -10:10 0:0')
        ENDIF
* Determine whether or not this assembly contains a BPRA, CRA, or APSRA.
  BPRAININSERTED=.FALSE.
  CRAINSERTED=.FALSE.
  APSRAININSERTED=.FALSE.
  IF (BANKNUM(COLUMN,ROW).NE.0) THEN
    IF (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'BPRA ') THEN
      BPRAININSERTED=.TRUE.
    ELSEIF (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'CRA ') THEN
      CRAINSERTED=.TRUE.
    ELSEIF (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'APSRA') THEN
      APSRAININSERTED=.TRUE.
    ENDIF
  ENDIF
  IF (BANDW.EQ..TRUE.) THEN
* Write the assembly lattice layout specification.
    WRITE(30,1300) ASSYUNIV(COLUMN,ROW) ! First framing row
1300      FORMAT(T11,I3,' 18R')
    WRITE(30,1302) ASSYUNIV(COLUMN,ROW) ! Second framing row
1302      FORMAT(T11,I3,' 18R')
    WRITE(30,1304) ASSYUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW), !
Fuel row 1
    c      ASSYUNIV(COLUMN,ROW)
1304      FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
    WRITE(30,1306) ASSYUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW), !
Fuel row 2
    c      ASSYUNIV(COLUMN,ROW)
1306      FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
    IF ((CRAINSERTED.EQ..FALSE.).AND.
    c      (APSRAININSERTED.EQ..FALSE.).AND.
    c      (BPRAININSERTED.EQ..FALSE.)) THEN
    c      WRITE(30,1308) ASSYUNIV(COLUMN,ROW), ! Fuel row 3
    c      FRUNIV(COLUMN,ROW),
    c      GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
    c      GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
    c      ASSYUNIV(COLUMN,ROW)
1308      FORMAT(T11,I3,' 1R ',I3,' 4R ',I4,1X,I3,
    c      ' 2R ',I4,1X,I3,' 4R ',I3,' 1R ')
    WRITE(30,1310) ASSYUNIV(COLUMN,ROW), ! Fuel row 4
    c      FRUNIV(COLUMN,ROW),
    c      GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
    c      GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
    c      ASSYUNIV(COLUMN,ROW)
1310      FORMAT(T11,I3,' 1R ',I3,' 2R ',I4,1X,I3,
    c      ' 6R ',I4,1X,I3,' 2R ',I3,' 1R ')
    WRITE(30,1312) ASSYUNIV(COLUMN,ROW), ! Fuel row 5
    c      FRUNIV(COLUMN,ROW),
    c      ASSYUNIV(COLUMN,ROW)
1312      FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 191 of 647

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WRITE(30,1314) ASSYUNIV(COLUMN,ROW), ! Fuel row 6
c   FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1314 FORMAT(T11,I3,' 1R ',I3,' 1R ',I4,1X,I3,
c      ' 1R ',I4,1X,I3,' 2R ',I4,1X,I3,' 1R ',
c      I4,1X,I3,' 1R ',I3,' 1R ')
WRITE(30,1316) ASSYUNIV(COLUMN,ROW), ! Fuel row 7
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1316 FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
WRITE(30,1318) ASSYUNIV(COLUMN,ROW), ! Fuel row 8
c   FRUNIV(COLUMN,ROW),
c   ITUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1318 FORMAT(T11,I3,' 1R ',I3,' 6R ',I4,1X,I3,
c      ' 6R ',I3,' 1R ')
WRITE(30,1320) ASSYUNIV(COLUMN,ROW), ! Fuel row 9
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1320 FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
WRITE(30,1322) ASSYUNIV(COLUMN,ROW), ! Fuel row 10
c   FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1322 FORMAT(T11,I3,' 1R ',I3,' 1R ',I4,1X,I3,
c      ' 1R ',I4,1X,I3,' 2R ',I4,1X,I3,' 1R ',
c      I4,1X,I3,' 1R ',I3,' 1R ')
WRITE(30,1324) ASSYUNIV(COLUMN,ROW), ! Fuel row 11
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1324 FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
WRITE(30,1326) ASSYUNIV(COLUMN,ROW), ! Fuel row 12
c   FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1326 FORMAT(T11,I3,' 1R ',I3,' 2R ',I4,1X,I3,
c      ' 6R ',I4,1X,I3,' 2R ',I3,' 1R ')
WRITE(30,1328) ASSYUNIV(COLUMN,ROW), ! Fuel row 13
c   FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1328 FORMAT(T11,I3,' 1R ',I3,' 4R ',I4,1X,I3,
c      ' 2R ',I4,1X,I3,' 4R ',I3,' 1R ')
ELSEIF (BPRAINSERTED.EQ..TRUE.) THEN
WRITE(30,1330) ASSYUNIV(COLUMN,ROW), ! Fuel row 3

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Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 192 of 647

```
c      FRUNIV(COLUMN,ROW) ,
c      BPRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      BPRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
1330   FORMAT(T11,I3,' 1R ',I3,' 4R ',I3,1X,I3,
c      ' 2R ',I3,1X,I3,' 4R ',I3,' 1R ')
      WRITE(30,1332) ASSYUNIV(COLUMN,ROW), ! Fuel row 4
c      FRUNIV(COLUMN,ROW) ,
c      BPRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      BPRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
1332   FORMAT(T11,I3,' 1R ',I3,' 2R ',I3,1X,I3,
c      ' 6R ',I3,1X,I3,' 2R ',I3,' 1R ')
      WRITE(30,1334) ASSYUNIV(COLUMN,ROW), ! Fuel row 5
c      FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
1334   FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
      WRITE(30,1336) ASSYUNIV(COLUMN,ROW), ! Fuel row 6
c      FRUNIV(COLUMN,ROW) ,
c      BPRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      BPRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      BPRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      BPRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
1336   FORMAT(T11,I3,' 1R ',I3,' 1R ',I3,1X,I3,
c      ' 1R ',I3,1X,I3,' 2R ',I3,1X,I3,' 1R ',
c      I3,1X,I3,' 1R ',I3,' 1R ')
      WRITE(30,1338) ASSYUNIV(COLUMN,ROW), ! Fuel row 7
c      FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
1338   FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
      WRITE(30,1340) ASSYUNIV(COLUMN,ROW), ! Fuel row 8
c      FRUNIV(COLUMN,ROW) ,
c      ITUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
1340   FORMAT(T11,I3,' 1R ',I3,' 6R ',I4,1X,I3,
c      ' 6R ',I3,' 1R ')
      WRITE(30,1342) ASSYUNIV(COLUMN,ROW), ! Fuel row 9
c      FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
1342   FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
      WRITE(30,1344) ASSYUNIV(COLUMN,ROW), ! Fuel row 10
c      FRUNIV(COLUMN,ROW) ,
c      BPRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      BPRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      BPRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      BPRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
1344   FORMAT(T11,I3,' 1R ',I3,' 1R ',I3,1X,I3,
c      ' 1R ',I3,1X,I3,' 2R ',I3,1X,I3,' 1R ',
c      I3,1X,I3,' 1R ',I3,' 1R ')
      WRITE(30,1346) ASSYUNIV(COLUMN,ROW), ! Fuel row 11
c      FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
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Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 193 of 647

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1346          FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
          WRITE(30,1348) ASSYUNIV(COLUMN,ROW), ! Fuel row 12
      c          FRUNIV(COLUMN,ROW),
      c          BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
      c          BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
      c          ASSYUNIV(COLUMN,ROW)
1348          FORMAT(T11,I3,' 1R ',I3,' 2R ',I3,1X,I3,
      c          ' 6R ',I3,1X,I3,' 2R ',I3,' 1R ')
          WRITE(30,1350) ASSYUNIV(COLUMN,ROW), ! Fuel row 13
      c          FRUNIV(COLUMN,ROW),
      c          BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
      c          BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
      c          ASSYUNIV(COLUMN,ROW)
1350          FORMAT(T11,I3,' 1R ',I3,' 4R ',I3,1X,I3,
      c          ' 2R ',I3,1X,I3,' 4R ',I3,' 1R ')
          ELSEIF (CRAINSERTED.EQ..TRUE.) THEN
      c          WRITE(30,1352) ASSYUNIV(COLUMN,ROW), ! Fuel row 3
      c          FRUNIV(COLUMN,ROW),
      c          CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
      c          CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
      c          ASSYUNIV(COLUMN,ROW)
1352          FORMAT(T11,I3,' 1R ',I3,' 4R ',I3,1X,I3,
      c          ' 2R ',I3,1X,I3,' 4R ',I3,' 1R ')
          WRITE(30,1354) ASSYUNIV(COLUMN,ROW), ! Fuel row 4
      c          FRUNIV(COLUMN,ROW),
      c          CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
      c          CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
      c          ASSYUNIV(COLUMN,ROW)
1354          FORMAT(T11,I3,' 1R ',I3,' 2R ',I3,1X,I3,
      c          ' 6R ',I3,1X,I3,' 2R ',I3,' 1R ')
          WRITE(30,1356) ASSYUNIV(COLUMN,ROW), ! Fuel row 5
      c          FRUNIV(COLUMN,ROW),
      c          ASSYUNIV(COLUMN,ROW)
1356          FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
          WRITE(30,1358) ASSYUNIV(COLUMN,ROW), ! Fuel row 6
      c          FRUNIV(COLUMN,ROW),
      c          CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
      c          CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
      c          CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
      c          CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
      c          ASSYUNIV(COLUMN,ROW)
1358          FORMAT(T11,I3,' 1R ',I3,' 1R ',I3,1X,I3,
      c          ' 1R ',I3,1X,I3,' 2R ',I3,1X,I3,' 1R ',
      c          I3,1X,I3,' 1R ',I3,' 1R ')
          WRITE(30,1360) ASSYUNIV(COLUMN,ROW), ! Fuel row 7
      c          FRUNIV(COLUMN,ROW),
      c          ASSYUNIV(COLUMN,ROW)
1360          FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
          WRITE(30,1362) ASSYUNIV(COLUMN,ROW), ! Fuel row 8
      c          FRUNIV(COLUMN,ROW),
      c          ITUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
      c          ASSYUNIV(COLUMN,ROW)
1362          FORMAT(T11,I3,' 1R ',I3,' 6R ',I4,1X,I3,
      c          ' 6R ',I3,' 1R ')

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 194 of 647

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WRITE(30,1364) ASSYUNIV(COLUMN,ROW), ! Fuel row 9
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1364 FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
WRITE(30,1366) ASSYUNIV(COLUMN,ROW), ! Fuel row 10
c   FRUNIV(COLUMN,ROW),
c   CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1366 FORMAT(T11,I3,' 1R ',I3,' 1R ',I3,1X,I3,
c   ' 1R ',I3,1X,I3,' 2R ',I3,1X,I3,' 1R ',
c   I3,1X,I3,' 1R ',I3,' 1R ')
WRITE(30,1368) ASSYUNIV(COLUMN,ROW), ! Fuel row 11
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1368 FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
WRITE(30,1370) ASSYUNIV(COLUMN,ROW), ! Fuel row 12
c   FRUNIV(COLUMN,ROW),
c   CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1370 FORMAT(T11,I3,' 1R ',I3,' 2R ',I3,1X,I3,
c   ' 6R ',I3,1X,I3,' 2R ',I3,' 1R ')
WRITE(30,1372) ASSYUNIV(COLUMN,ROW), ! Fuel row 13
c   FRUNIV(COLUMN,ROW),
c   CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1372 FORMAT(T11,I3,' 1R ',I3,' 4R ',I3,1X,I3,
c   ' 2R ',I3,1X,I3,' 4R ',I3,' 1R ')
ELSEIF (APSRINSERTED.EQ..TRUE.) THEN
WRITE(30,1374) ASSYUNIV(COLUMN,ROW), ! Fuel row 3
c   FRUNIV(COLUMN,ROW),
c   APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1374 FORMAT(T11,I3,' 1R ',I3,' 4R ',I3,1X,I3,
c   ' 2R ',I3,1X,I3,' 4R ',I3,' 1R ')
WRITE(30,1376) ASSYUNIV(COLUMN,ROW), ! Fuel row 4
c   FRUNIV(COLUMN,ROW),
c   APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1376 FORMAT(T11,I3,' 1R ',I3,' 2R ',I3,1X,I3,
c   ' 6R ',I3,1X,I3,' 2R ',I3,' 1R ')
WRITE(30,1378) ASSYUNIV(COLUMN,ROW), ! Fuel row 5
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
1378 FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
WRITE(30,1380) ASSYUNIV(COLUMN,ROW), ! Fuel row 6
c   FRUNIV(COLUMN,ROW),
c   APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 195 of 647

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c      APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
1380   FORMAT(T11,I3,' 1R ',I3,' 1R ',I3,1X,I3,
c      ' 1R ',I3,1X,I3,' 2R ',I3,1X,I3,' 1R ',
c      I3,1X,I3,' 1R ',I3,' 1R ')
c      WRITE(30,1382) ASSYUNIV(COLUMN,ROW), ! Fuel row 7
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
1382   FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
c      WRITE(30,1384) ASSYUNIV(COLUMN,ROW), ! Fuel row 8
c      FRUNIV(COLUMN,ROW),
c      ITUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
1384   FORMAT(T11,I3,' 1R ',I3,' 6R ',I4,1X,I3,
c      ' 6R ',I3,' 1R ')
c      WRITE(30,1386) ASSYUNIV(COLUMN,ROW), ! Fuel row 9
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
1386   FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
c      WRITE(30,1388) ASSYUNIV(COLUMN,ROW), ! Fuel row 10
c      FRUNIV(COLUMN,ROW),
c      APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
1388   FORMAT(T11,I3,' 1R ',I3,' 1R ',I3,1X,I3,
c      ' 1R ',I3,1X,I3,' 2R ',I3,1X,I3,' 1R ',
c      I3,1X,I3,' 1R ',I3,' 1R ')
c      WRITE(30,1390) ASSYUNIV(COLUMN,ROW), ! Fuel row 11
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
1390   FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
c      WRITE(30,1392) ASSYUNIV(COLUMN,ROW), ! Fuel row 12
c      FRUNIV(COLUMN,ROW),
c      APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
1392   FORMAT(T11,I3,' 1R ',I3,' 2R ',I3,1X,I3,
c      ' 6R ',I3,1X,I3,' 2R ',I3,' 1R ')
c      WRITE(30,1394) ASSYUNIV(COLUMN,ROW), ! Fuel row 13
c      FRUNIV(COLUMN,ROW),
c      APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
1394   FORMAT(T11,I3,' 1R ',I3,' 4R ',I3,1X,I3,
c      ' 2R ',I3,1X,I3,' 4R ',I3,' 1R ')
c      ENDIF
c      WRITE(30,1396) ASSYUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW), !
Fuel row 14
c      ASSYUNIV(COLUMN,ROW)
1396   FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')

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Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 196 of 647

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WRITE(30,1398) ASSYUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW), !
Fuel row 15
  c ASSYUNIV(COLUMN,ROW)
  1398 FORMAT(T11,I3,' 1R ',I3,' 14R ',I3,' 1R')
      WRITE(30,1400) ASSYUNIV(COLUMN,ROW) ! Second-to-last framing
row
  1400 FORMAT(T11,I3,' 18R')
      WRITE(30,1402) ASSYUNIV(COLUMN,ROW) ! Last framing row
  1402 FORMAT(T11,I3,' 18R')
*
      ELSEIF (WESTINGHOUSE.EQ..TRUE.) THEN
*
      WRITE(30,1404) ASSYUNIV(COLUMN,ROW) ! First framing row
  1404 FORMAT(T11,I3,' 20R')
      WRITE(30,1406) ASSYUNIV(COLUMN,ROW) ! Second framing row
  1406 FORMAT(T11,I3,' 20R')
      WRITE(30,1408) ASSYUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW), !
Fuel row 1
  c ASSYUNIV(COLUMN,ROW)
  1408 FORMAT(T11,I3,' 1R ',I3,' 16R ',I3,' 1R')
      WRITE(30,1410) ASSYUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW), !
Fuel row 2
  c ASSYUNIV(COLUMN,ROW)
  1410 FORMAT(T11,I3,' 1R ',I3,' 16R ',I3,' 1R')
      IF ((CRAININSERTED.EQ..FALSE.).AND.
  c (APSRAININSERTED.EQ..FALSE.).AND.
  c (BPRAININSERTED.EQ..FALSE.)) THEN
  c WRITE(30,1412) ASSYUNIV(COLUMN,ROW), ! Fuel row 3
  c FRUNIV(COLUMN,ROW),
  c GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
  c GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
  c GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
  c ASSYUNIV(COLUMN,ROW)
  1412 FORMAT(T11,I3,' 1R ',I3,' 4R ',I4,1X,I3,
  c ' 1R ',I4,1X,I3,' 1R ',I4,1X,I3,' 4R ',I3,' 1R ')
      WRITE(30,1414) ASSYUNIV(COLUMN,ROW), ! Fuel row 4
  c FRUNIV(COLUMN,ROW),
  c GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
  c GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
  c ASSYUNIV(COLUMN,ROW)
  1414 FORMAT(T11,I3,' 1R ',I3,' 2R ',I4,1X,I3,
  c ' 8R ',I4,1X,I3,' 2R ',I3,' 1R ')
      WRITE(30,1416) ASSYUNIV(COLUMN,ROW), ! Fuel row 5
  c FRUNIV(COLUMN,ROW),
  c ASSYUNIV(COLUMN,ROW)
  1416 FORMAT(T11,I3,' 1R ',I3,' 16R ',I3,' 1R')
      WRITE(30,1418) ASSYUNIV(COLUMN,ROW), ! Fuel row 6
  c FRUNIV(COLUMN,ROW),
  c GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
  c GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
  c GTUNIV(COLUMN,ROW)
      WRITE(30,1419) FRUNIV(COLUMN,ROW), ! Fuel row 6
  c GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
  c GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 197 of 647

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      c      ASSYUNIV (COLUMN,ROW)
1418      FORMAT(T11,I3,' 1R ',I3,' 1R ',I4,1X,I3,
      c      ' 1R ',I4,1X,I3,' 1R ',I4)
1419      FORMAT(T11,I3,' 1R ',
      c      I4,1X,I3,' 1R ',I4,1X,I3,' 1R ',I3,' 1R ')
      c      WRITE(30,1420) ASSYUNIV(COLUMN,ROW), ! Fuel row 7.
      c      FRUNIV (COLUMN,ROW) ,
      c      ASSYUNIV (COLUMN,ROW)
1420      FORMAT(T11,I3,' 1R ',I3,' 16R ',I3,' 1R')
      c      WRITE(30,1422) ASSYUNIV(COLUMN,ROW), ! Fuel row 8
      c      FRUNIV (COLUMN,ROW) ,
      c      ASSYUNIV (COLUMN,ROW)
1422      FORMAT(T11,I3,' 1R ',I3,' 16R ',I3,' 1R')
      c      WRITE(30,1424) ASSYUNIV(COLUMN,ROW), ! Fuel row 9
      c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
      c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
      c      FRUNIV (COLUMN,ROW) , ITUNIV (COLUMN,ROW)
      c      WRITE(30,1425) ! Fuel row 9
      c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
      c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
      c      FRUNIV (COLUMN,ROW) , ASSYUNIV (COLUMN,ROW)
1424      FORMAT(T11,I3,' 1R ',I3,' 1R ',I4,1X,
      c      I3,' 1R ',I4,1X,I3,' 1R ',I4)
1425      FORMAT(T11,I3,' 1R ',
      c      I4,1X,I3,' 1R ',I4,1X,I3,' 1R ',I3,' 1R ')
      c      WRITE(30,1426) ASSYUNIV(COLUMN,ROW), ! Fuel row 10
      c      FRUNIV (COLUMN,ROW) ,
      c      ASSYUNIV (COLUMN,ROW)
1426      FORMAT(T11,I3,' 1R ',I3,' 16R ',I3,' 1R')
      c      WRITE(30,1428) ASSYUNIV(COLUMN,ROW), ! Fuel row 11
      c      FRUNIV (COLUMN,ROW) ,
      c      ASSYUNIV (COLUMN,ROW)
1428      FORMAT(T11,I3,' 1R ',I3,' 16R ',I3,' 1R')
      c      WRITE(30,1430) ASSYUNIV(COLUMN,ROW), ! Fuel row 12
      c      FRUNIV (COLUMN,ROW) ,
      c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
      c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
      c      GTUNIV (COLUMN,ROW)
      c      WRITE(30,1431) FRUNIV (COLUMN,ROW) , ! Fuel row 12
      c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
      c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
      c      ASSYUNIV (COLUMN,ROW)
1430      FORMAT(T11,I3,' 1R ',I3,' 1R ',I4,1X,I3,
      c      ' 1R ',I4,1X,I3,' 1R ',I4)
1431      FORMAT(T11,I3,' 1R ',
      c      I4,1X,I3,' 1R ',I4,1X,I3,' 1R ',I3,' 1R ')
      c      WRITE(30,1432) ASSYUNIV(COLUMN,ROW), ! Fuel row 13
      c      FRUNIV (COLUMN,ROW) ,
      c      ASSYUNIV (COLUMN,ROW)
1432      FORMAT(T11,I3,' 1R ',I3,' 16R ',I3,' 1R')
      c      WRITE(30,1434) ASSYUNIV(COLUMN,ROW), ! Fuel row 14
      c      FRUNIV (COLUMN,ROW) ,
      c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
      c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 198 of 647

```
c          ASSYUNIV(COLUMN,ROW)
1434      FORMAT(T11,I3,' 1R ',I3,' 2R ',I4,1X,I3,
c          ' 8R ',I4,1X,I3,' 2R ',I3,' 1R ')
          WRITE(30,1436) ASSYUNIV(COLUMN,ROW), ! Fuel row 15
c          FRUNIV(COLUMN,ROW),
c          GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c          GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c          GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c          ASSYUNIV(COLUMN,ROW)
1436      FORMAT(T11,I3,' 1R ',I3,' 4R ',I4,1X,I3,
c          ' 1R ',I4,1X,I3,' 1R ',I4,1X,I3,' 4R ',I3,' 1R ')
          ELSEIF (BPRAINSERTEDEQ.TRUE.) THEN
          IF (WBPRATYPE(BANKNUM(COLUMN,ROW)).EQ.1) THEN ! 4 BPR assembly
          WRITE(30,1412) ASSYUNIV(COLUMN,ROW), ! Fuel row 3
c          FRUNIV(COLUMN,ROW),
c          GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c          GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c          GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c          ASSYUNIV(COLUMN,ROW)
          WRITE(30,1414) ASSYUNIV(COLUMN,ROW), ! Fuel row 4
c          FRUNIV(COLUMN,ROW),
c          GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c          GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c          ASSYUNIV(COLUMN,ROW)
          WRITE(30,1416) ASSYUNIV(COLUMN,ROW), ! Fuel row 5
c          FRUNIV(COLUMN,ROW),
c          ASSYUNIV(COLUMN,ROW)
          WRITE(30,1418) ASSYUNIV(COLUMN,ROW), ! Fuel row 6
c          FRUNIV(COLUMN,ROW),
c          GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c          BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c          GTUNIV(COLUMN,ROW)
          WRITE(30,1419) FRUNIV(COLUMN,ROW), ! Fuel row 6
c          BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c          GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c          ASSYUNIV(COLUMN,ROW)
          WRITE(30,1420) ASSYUNIV(COLUMN,ROW), ! Fuel row 7
c          FRUNIV(COLUMN,ROW),
c          ASSYUNIV(COLUMN,ROW)
          WRITE(30,1422) ASSYUNIV(COLUMN,ROW), ! Fuel row 8
c          FRUNIV(COLUMN,ROW),
c          ASSYUNIV(COLUMN,ROW)
          WRITE(30,1424) ASSYUNIV(COLUMN,ROW), ! Fuel row 9
c          FRUNIV(COLUMN,ROW), GTUNIV(COLUMN,ROW),
c          FRUNIV(COLUMN,ROW), GTUNIV(COLUMN,ROW),
c          FRUNIV(COLUMN,ROW), ITUNIV(COLUMN,ROW)
          WRITE(30,1425) ! Fuel row 9
c          FRUNIV(COLUMN,ROW), GTUNIV(COLUMN,ROW),
c          FRUNIV(COLUMN,ROW), GTUNIV(COLUMN,ROW),
c          FRUNIV(COLUMN,ROW), ASSYUNIV(COLUMN,ROW)
          WRITE(30,1426) ASSYUNIV(COLUMN,ROW), ! Fuel row 10
c          FRUNIV(COLUMN,ROW),
c          ASSYUNIV(COLUMN,ROW)
          WRITE(30,1428) ASSYUNIV(COLUMN,ROW), ! Fuel row 11
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 199 of 647

```
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1430) ASSYUNIV (COLUMN,ROW) , ! Fuel row 12
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , BPRAUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW)
      WRITE (30,1431) ! Fuel row 12
c      FRUNIV (COLUMN,ROW) , BPRAUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , ASSYUNIV (COLUMN,ROW)
      WRITE (30,1432) ASSYUNIV (COLUMN,ROW) , ! Fuel row 13
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1434) ASSYUNIV (COLUMN,ROW) , ! Fuel row 14
c      FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1436) ASSYUNIV (COLUMN,ROW) , ! Fuel row 15
c      FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
ELSEIF (WBPRATYPE (BANKNUM (COLUMN,ROW)) .EQ.2) THEN ! 8 BPR
assembly
      WRITE (30,1412) ASSYUNIV (COLUMN,ROW) , ! Fuel row 3
c      FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1414) ASSYUNIV (COLUMN,ROW) , ! Fuel row 4
c      FRUNIV (COLUMN,ROW) ,
c      BPRAUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      BPRAUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1416) ASSYUNIV (COLUMN,ROW) , ! Fuel row 5
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1418) ASSYUNIV (COLUMN,ROW) , ! Fuel row 6
c      FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      BPRAUNIV (COLUMN,ROW)
      WRITE (30,1419) FRUNIV (COLUMN,ROW) , ! Fuel row 6
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1420) ASSYUNIV (COLUMN,ROW) , ! Fuel row 7
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1422) ASSYUNIV (COLUMN,ROW) , ! Fuel row 8
c      FRUNIV (COLUMN,ROW) ,
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 200 of 647

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c      ASSYUNIV (COLUMN, ROW)
      WRITE (30, 1424) ASSYUNIV (COLUMN, ROW), ! Fuel row 9
c      FRUNIV (COLUMN, ROW), GTUNIV (COLUMN, ROW),
c      FRUNIV (COLUMN, ROW), BPRAUNIV (COLUMN, ROW),
c      FRUNIV (COLUMN, ROW), ITUNIV (COLUMN, ROW)
      WRITE (30, 1425) ! Fuel row 9
c      FRUNIV (COLUMN, ROW), BPRAUNIV (COLUMN, ROW),
c      FRUNIV (COLUMN, ROW), GTUNIV (COLUMN, ROW),
c      FRUNIV (COLUMN, ROW), ASSYUNIV (COLUMN, ROW)
      WRITE (30, 1426) ASSYUNIV (COLUMN, ROW), ! Fuel row 10
c      FRUNIV (COLUMN, ROW),
c      ASSYUNIV (COLUMN, ROW)
      WRITE (30, 1428) ASSYUNIV (COLUMN, ROW), ! Fuel row 11
c      FRUNIV (COLUMN, ROW),
c      ASSYUNIV (COLUMN, ROW)
      WRITE (30, 1430) ASSYUNIV (COLUMN, ROW), ! Fuel row 12
c      FRUNIV (COLUMN, ROW), GTUNIV (COLUMN, ROW),
c      FRUNIV (COLUMN, ROW), GTUNIV (COLUMN, ROW),
c      FRUNIV (COLUMN, ROW), BPRAUNIV (COLUMN, ROW)
      WRITE (30, 1431) ! Fuel row 12
c      FRUNIV (COLUMN, ROW), GTUNIV (COLUMN, ROW),
c      FRUNIV (COLUMN, ROW), GTUNIV (COLUMN, ROW),
c      FRUNIV (COLUMN, ROW), ASSYUNIV (COLUMN, ROW)
      WRITE (30, 1432) ASSYUNIV (COLUMN, ROW), ! Fuel row 13
c      FRUNIV (COLUMN, ROW),
c      ASSYUNIV (COLUMN, ROW)
      WRITE (30, 1434) ASSYUNIV (COLUMN, ROW), ! Fuel row 14
c      FRUNIV (COLUMN, ROW),
c      BPRAUNIV (COLUMN, ROW), FRUNIV (COLUMN, ROW),
c      BPRAUNIV (COLUMN, ROW), FRUNIV (COLUMN, ROW),
c      ASSYUNIV (COLUMN, ROW)
      WRITE (30, 1436) ASSYUNIV (COLUMN, ROW), ! Fuel row 15
c      FRUNIV (COLUMN, ROW),
c      GTUNIV (COLUMN, ROW), FRUNIV (COLUMN, ROW),
c      GTUNIV (COLUMN, ROW), FRUNIV (COLUMN, ROW),
c      GTUNIV (COLUMN, ROW), FRUNIV (COLUMN, ROW),
c      ASSYUNIV (COLUMN, ROW)
      ELSEIF (WBPRATYPE (BANKNUM (COLUMN, ROW)) .EQ. 3) THEN ! 9 BPR
assembly
      WRITE (30, 1412) ASSYUNIV (COLUMN, ROW), ! Fuel row 3
c      FRUNIV (COLUMN, ROW),
c      BPRAUNIV (COLUMN, ROW), FRUNIV (COLUMN, ROW),
c      BPRAUNIV (COLUMN, ROW), FRUNIV (COLUMN, ROW),
c      BPRAUNIV (COLUMN, ROW), FRUNIV (COLUMN, ROW),
c      ASSYUNIV (COLUMN, ROW)
      WRITE (30, 1414) ASSYUNIV (COLUMN, ROW), ! Fuel row 4
c      FRUNIV (COLUMN, ROW),
c      BPRAUNIV (COLUMN, ROW), FRUNIV (COLUMN, ROW),
c      GTUNIV (COLUMN, ROW), FRUNIV (COLUMN, ROW),
c      ASSYUNIV (COLUMN, ROW)
      WRITE (30, 1416) ASSYUNIV (COLUMN, ROW), ! Fuel row 5
c      FRUNIV (COLUMN, ROW),
c      ASSYUNIV (COLUMN, ROW)
      WRITE (30, 1418) ASSYUNIV (COLUMN, ROW), ! Fuel row 6
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 201 of 647

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c      FRUNIV (COLUMN,ROW) ,
c      BPRAUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      BPRAUNIV (COLUMN,ROW)
c      WRITE (30,1419) FRUNIV (COLUMN,ROW) , ! Fuel row 6
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
c      WRITE (30,1420) ASSYUNIV (COLUMN,ROW) , ! Fuel row 7
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
c      WRITE (30,1422) ASSYUNIV (COLUMN,ROW) , ! Fuel row 8
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
c      WRITE (30,1424) ASSYUNIV (COLUMN,ROW) , ! Fuel row 9
c      FRUNIV (COLUMN,ROW) , BPRAUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , BPRAUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , ITUNIV (COLUMN,ROW)
c      WRITE (30,1425) ! Fuel row 9
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , ASSYUNIV (COLUMN,ROW)
c      WRITE (30,1426) ASSYUNIV (COLUMN,ROW) , ! Fuel row 10
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
c      WRITE (30,1428) ASSYUNIV (COLUMN,ROW) , ! Fuel row 11
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
c      WRITE (30,1430) ASSYUNIV (COLUMN,ROW) , ! Fuel row 12
c      FRUNIV (COLUMN,ROW) , BPRAUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW)
c      WRITE (30,1431) ! Fuel row 12
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , ASSYUNIV (COLUMN,ROW)
c      WRITE (30,1432) ASSYUNIV (COLUMN,ROW) , ! Fuel row 13
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
c      WRITE (30,1434) ASSYUNIV (COLUMN,ROW) , ! Fuel row 14
c      FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
c      WRITE (30,1436) ASSYUNIV (COLUMN,ROW) , ! Fuel row 15
c      FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
ELSEIF (WBPRATYPE (BANKNUM (COLUMN,ROW)) .EQ. 4) THEN ! 10 BPR
assembly
c      WRITE (30,1412) ASSYUNIV (COLUMN,ROW) , ! Fuel row 3
c      FRUNIV (COLUMN,ROW) ,

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 202 of 647

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c      BPRAUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      BPRAUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1414) ASSYUNIV (COLUMN,ROW) , ! Fuel row 4
c      FRUNIV (COLUMN,ROW) ,
c      BPRAUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1416) ASSYUNIV (COLUMN,ROW) , ! Fuel row 5
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1418) ASSYUNIV (COLUMN,ROW) , ! Fuel row 6
c      FRUNIV (COLUMN,ROW) ,
c      BPRAUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW)
      WRITE (30,1419) FRUNIV (COLUMN,ROW) , ! Fuel row 6
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      GTUNIV (COLUMN,ROW) , FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1420) ASSYUNIV (COLUMN,ROW) , ! Fuel row 7
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1422) ASSYUNIV (COLUMN,ROW) , ! Fuel row 8
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1424) ASSYUNIV (COLUMN,ROW) , ! Fuel row 9
c      FRUNIV (COLUMN,ROW) , BPRAUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , BPRAUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , ITUNIV (COLUMN,ROW)
      WRITE (30,1425) ! Fuel row 9
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , ASSYUNIV (COLUMN,ROW)
      WRITE (30,1426) ASSYUNIV (COLUMN,ROW) , ! Fuel row 10
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1428) ASSYUNIV (COLUMN,ROW) , ! Fuel row 11
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1430) ASSYUNIV (COLUMN,ROW) , ! Fuel row 12
c      FRUNIV (COLUMN,ROW) , BPRAUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW)
      WRITE (30,1431) ! Fuel row 12
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , GTUNIV (COLUMN,ROW) ,
c      FRUNIV (COLUMN,ROW) , ASSYUNIV (COLUMN,ROW)
      WRITE (30,1432) ASSYUNIV (COLUMN,ROW) , ! Fuel row 13
c      FRUNIV (COLUMN,ROW) ,
c      ASSYUNIV (COLUMN,ROW)
      WRITE (30,1434) ASSYUNIV (COLUMN,ROW) , ! Fuel row 14
c      FRUNIV (COLUMN,ROW) ,
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 203 of 647

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c      BPRUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      GTUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
c      WRITE(30,1436) ASSYUNIV(COLUMN,ROW) , ! Fuel row 15
c      FRUNIV(COLUMN,ROW) ,
c      BPRUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      BPRUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      GTUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
ELSEIF (WBPRATYPE(BANKNUM(COLUMN,ROW)).EQ.5) THEN ! 12 BPR
assembly
c      WRITE(30,1412) ASSYUNIV(COLUMN,ROW) , ! Fuel row 3
c      FRUNIV(COLUMN,ROW) ,
c      BPRUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      GTUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      BPRUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
c      WRITE(30,1414) ASSYUNIV(COLUMN,ROW) , ! Fuel row 4
c      FRUNIV(COLUMN,ROW) ,
c      GTUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      GTUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
c      WRITE(30,1416) ASSYUNIV(COLUMN,ROW) , ! Fuel row 5
c      FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
c      WRITE(30,1418) ASSYUNIV(COLUMN,ROW) , ! Fuel row 6
c      FRUNIV(COLUMN,ROW) ,
c      BPRUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      GTUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      BPRUNIV(COLUMN,ROW)
c      WRITE(30,1419) FRUNIV(COLUMN,ROW) , ! Fuel row 6
c      GTUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      BPRUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
c      WRITE(30,1420) ASSYUNIV(COLUMN,ROW) , ! Fuel row 7
c      FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
c      WRITE(30,1422) ASSYUNIV(COLUMN,ROW) , ! Fuel row 8
c      FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
c      WRITE(30,1424) ASSYUNIV(COLUMN,ROW) , ! Fuel row 9
c      FRUNIV(COLUMN,ROW) , GTUNIV(COLUMN,ROW) ,
c      FRUNIV(COLUMN,ROW) , BPRUNIV(COLUMN,ROW) ,
c      FRUNIV(COLUMN,ROW) , ITUNIV(COLUMN,ROW)
c      WRITE(30,1425) ! Fuel row 9
c      FRUNIV(COLUMN,ROW) , BPRUNIV(COLUMN,ROW) ,
c      FRUNIV(COLUMN,ROW) , GTUNIV(COLUMN,ROW) ,
c      FRUNIV(COLUMN,ROW) , ASSYUNIV(COLUMN,ROW)
c      WRITE(30,1426) ASSYUNIV(COLUMN,ROW) , ! Fuel row 10
c      FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
c      WRITE(30,1428) ASSYUNIV(COLUMN,ROW) , ! Fuel row 11
c      FRUNIV(COLUMN,ROW) ,
c      ASSYUNIV(COLUMN,ROW)
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 204 of 647

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WRITE(30,1430) ASSYUNIV(COLUMN,ROW), ! Fuel row 12
c   FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW),
c   FRUNIV(COLUMN,ROW), GTUNIV(COLUMN,ROW),
c   FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW)
WRITE(30,1431) ! Fuel row 12
c   FRUNIV(COLUMN,ROW), GTUNIV(COLUMN,ROW),
c   FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW),
c   FRUNIV(COLUMN,ROW), ASSYUNIV(COLUMN,ROW)
WRITE(30,1432) ASSYUNIV(COLUMN,ROW), ! Fuel row 13
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1434) ASSYUNIV(COLUMN,ROW), ! Fuel row 14
c   FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1436) ASSYUNIV(COLUMN,ROW), ! Fuel row 15
c   FRUNIV(COLUMN,ROW),
c   BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
ELSEIF (WBPRATYPE(BANKNUM(COLUMN,ROW)).EQ.6) THEN ! 16 BPR
assembly
WRITE(30,1412) ASSYUNIV(COLUMN,ROW), ! Fuel row 3
c   FRUNIV(COLUMN,ROW),
c   BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1414) ASSYUNIV(COLUMN,ROW), ! Fuel row 4
c   FRUNIV(COLUMN,ROW),
c   BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1416) ASSYUNIV(COLUMN,ROW), ! Fuel row 5
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1418) ASSYUNIV(COLUMN,ROW), ! Fuel row 6
c   FRUNIV(COLUMN,ROW),
c   BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   BPRAUNIV(COLUMN,ROW)
WRITE(30,1419) FRUNIV(COLUMN,ROW), ! Fuel row 6
c   GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1420) ASSYUNIV(COLUMN,ROW), ! Fuel row 7
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1422) ASSYUNIV(COLUMN,ROW), ! Fuel row 8
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1424) ASSYUNIV(COLUMN,ROW), ! Fuel row 9

```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 205 of 647

```
c      FRUNIV(COLUMN,ROW), GTUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), ITUNIV(COLUMN,ROW)
WRITE(30,1425) ! Fuel row 9
c      FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), GTUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), ASSYUNIV(COLUMN,ROW)
WRITE(30,1426) ASSYUNIV(COLUMN,ROW), ! Fuel row 10
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
WRITE(30,1428) ASSYUNIV(COLUMN,ROW), ! Fuel row 11
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
WRITE(30,1430) ASSYUNIV(COLUMN,ROW), ! Fuel row 12
c      FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), GTUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW)
WRITE(30,1431) ! Fuel row 12
c      FRUNIV(COLUMN,ROW), GTUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), ASSYUNIV(COLUMN,ROW)
WRITE(30,1432) ASSYUNIV(COLUMN,ROW), ! Fuel row 13
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
WRITE(30,1434) ASSYUNIV(COLUMN,ROW), ! Fuel row 14
c      FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
WRITE(30,1436) ASSYUNIV(COLUMN,ROW), ! Fuel row 15
c      FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
ELSEIF (WBPRATYPE(BANKNUM(COLUMN,ROW)).EQ.7) THEN
WRITE(30,1412) ASSYUNIV(COLUMN,ROW), ! Fuel row 3
c      FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
WRITE(30,1414) ASSYUNIV(COLUMN,ROW), ! Fuel row 4
c      FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
WRITE(30,1416) ASSYUNIV(COLUMN,ROW), ! Fuel row 5
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
WRITE(30,1418) ASSYUNIV(COLUMN,ROW), ! Fuel row 6
c      FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 206 of 647

```
c      BPRAUNIV(COLUMN,ROW)
      WRITE(30,1419) FRUNIV(COLUMN,ROW), ! Fuel row 6
c      GTUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1420) ASSYUNIV(COLUMN,ROW), ! Fuel row 7
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1422) ASSYUNIV(COLUMN,ROW), ! Fuel row 8
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1424) ASSYUNIV(COLUMN,ROW), ! Fuel row 9
c      FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), ITUNIV(COLUMN,ROW)
      WRITE(30,1425) ! Fuel row 9
c      FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), ASSYUNIV(COLUMN,ROW)
      WRITE(30,1426) ASSYUNIV(COLUMN,ROW), ! Fuel row 10
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1428) ASSYUNIV(COLUMN,ROW), ! Fuel row 11
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1430) ASSYUNIV(COLUMN,ROW), ! Fuel row 12
c      FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), GTUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW)
      WRITE(30,1431) ! Fuel row 12
c      FRUNIV(COLUMN,ROW), GTUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), BPRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), ASSYUNIV(COLUMN,ROW)
      WRITE(30,1432) ASSYUNIV(COLUMN,ROW), ! Fuel row 13
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1434) ASSYUNIV(COLUMN,ROW), ! Fuel row 14
c      FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1436) ASSYUNIV(COLUMN,ROW), ! Fuel row 15
c      FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      BPRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      ENDIF
      ELSEIF (CRAINSERTED.EQ..TRUE.) THEN
c      WRITE(30,1412) ASSYUNIV(COLUMN,ROW), ! Fuel row 3
c      FRUNIV(COLUMN,ROW),
c      CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 207 of 647

```
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1414) ASSYUNIV(COLUMN,ROW), ! Fuel row 4
c      FRUNIV(COLUMN,ROW),
c      CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1416) ASSYUNIV(COLUMN,ROW), ! Fuel row 5
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1418) ASSYUNIV(COLUMN,ROW), ! Fuel row 6
c      FRUNIV(COLUMN,ROW),
c      CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      CRAUNIV(COLUMN,ROW)
      WRITE(30,1419) FRUNIV(COLUMN,ROW), ! Fuel row 6
c      CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1420) ASSYUNIV(COLUMN,ROW), ! Fuel row 7
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1422) ASSYUNIV(COLUMN,ROW), ! Fuel row 8
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1424) ASSYUNIV(COLUMN,ROW), ! Fuel row 9
c      FRUNIV(COLUMN,ROW), CRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), CRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), ITUNIV(COLUMN,ROW)
      WRITE(30,1425) ! Fuel row 9
c      FRUNIV(COLUMN,ROW), CRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), CRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), ASSYUNIV(COLUMN,ROW)
      WRITE(30,1426) ASSYUNIV(COLUMN,ROW), ! Fuel row 10
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1428) ASSYUNIV(COLUMN,ROW), ! Fuel row 11
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1430) ASSYUNIV(COLUMN,ROW), ! Fuel row 12
c      FRUNIV(COLUMN,ROW), CRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), CRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), CRAUNIV(COLUMN,ROW)
      WRITE(30,1431) ! Fuel row 12
c      FRUNIV(COLUMN,ROW), CRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), CRAUNIV(COLUMN,ROW),
c      FRUNIV(COLUMN,ROW), ASSYUNIV(COLUMN,ROW)
      WRITE(30,1432) ASSYUNIV(COLUMN,ROW), ! Fuel row 13
c      FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
      WRITE(30,1434) ASSYUNIV(COLUMN,ROW), ! Fuel row 14
c      FRUNIV(COLUMN,ROW),
c      CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c      ASSYUNIV(COLUMN,ROW)
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 208 of 647

```
WRITE(30,1436) ASSYUNIV(COLUMN,ROW), ! Fuel row 15
c   FRUNIV(COLUMN,ROW),
c   CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   CRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
ELSEIF (APSRAINSERTED.EQ..TRUE.) THEN
WRITE(30,1412) ASSYUNIV(COLUMN,ROW), ! Fuel row 3
c   FRUNIV(COLUMN,ROW),
c   APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1414) ASSYUNIV(COLUMN,ROW), ! Fuel row 4
c   FRUNIV(COLUMN,ROW),
c   APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1416) ASSYUNIV(COLUMN,ROW), ! Fuel row 5
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1418) ASSYUNIV(COLUMN,ROW), ! Fuel row 6
c   FRUNIV(COLUMN,ROW),
c   APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   APSRAUNIV(COLUMN,ROW)
WRITE(30,1419) FRUNIV(COLUMN,ROW), ! Fuel row 6
c   APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   APSRAUNIV(COLUMN,ROW), FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1420) ASSYUNIV(COLUMN,ROW), ! Fuel row 7
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1422) ASSYUNIV(COLUMN,ROW), ! Fuel row 8
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1424) ASSYUNIV(COLUMN,ROW), ! Fuel row 9
c   FRUNIV(COLUMN,ROW), APSRAUNIV(COLUMN,ROW),
c   FRUNIV(COLUMN,ROW), APSRAUNIV(COLUMN,ROW),
c   FRUNIV(COLUMN,ROW), ITUNIV(COLUMN,ROW)
WRITE(30,1425) ! Fuel row 9
c   FRUNIV(COLUMN,ROW), APSRAUNIV(COLUMN,ROW),
c   FRUNIV(COLUMN,ROW), APSRAUNIV(COLUMN,ROW),
c   FRUNIV(COLUMN,ROW), ASSYUNIV(COLUMN,ROW)
WRITE(30,1426) ASSYUNIV(COLUMN,ROW), ! Fuel row 10
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1428) ASSYUNIV(COLUMN,ROW), ! Fuel row 11
c   FRUNIV(COLUMN,ROW),
c   ASSYUNIV(COLUMN,ROW)
WRITE(30,1430) ASSYUNIV(COLUMN,ROW), ! Fuel row 12
c   FRUNIV(COLUMN,ROW), APSRAUNIV(COLUMN,ROW),
c   FRUNIV(COLUMN,ROW), APSRAUNIV(COLUMN,ROW),
c   FRUNIV(COLUMN,ROW), APSRAUNIV(COLUMN,ROW)
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 209 of 647

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                WRITE(30,1431) ! Fuel row 12
      c          FRUNIV(COLUMN,ROW) , APSRAUNIV(COLUMN,ROW) ,
      c          FRUNIV(COLUMN,ROW) , APSRAUNIV(COLUMN,ROW) ,
      c          FRUNIV(COLUMN,ROW) , ASSYUNIV(COLUMN,ROW)
                WRITE(30,1432) ASSYUNIV(COLUMN,ROW) , ! Fuel row 13
      c          FRUNIV(COLUMN,ROW) ,
      c          ASSYUNIV(COLUMN,ROW)
                WRITE(30,1434) ASSYUNIV(COLUMN,ROW) , ! Fuel row 14
      c          FRUNIV(COLUMN,ROW) ,
      c          APSRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
      c          APSRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
      c          ASSYUNIV(COLUMN,ROW)
                WRITE(30,1436) ASSYUNIV(COLUMN,ROW) , ! Fuel row 15
      c          FRUNIV(COLUMN,ROW) ,
      c          APSRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
      c          APSRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
      c          APSRAUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) ,
      c          ASSYUNIV(COLUMN,ROW)
                ENDIF
                WRITE(30,1438) ASSYUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) , !
Fuel row 16
      c          ASSYUNIV(COLUMN,ROW)
      1438      FORMAT(T11,I3,' 1R ',I3,' 16R ',I3,' 1R')
                WRITE(30,1440) ASSYUNIV(COLUMN,ROW) , FRUNIV(COLUMN,ROW) , !
Fuel row 17
      c          ASSYUNIV(COLUMN,ROW)
      1440      FORMAT(T11,I3,' 1R ',I3,' 16R ',I3,' 1R')
                WRITE(30,1442) ASSYUNIV(COLUMN,ROW) ! Second-to-last framing
row
      1442      FORMAT(T11,I3,' 20R')
                WRITE(30,1444) ASSYUNIV(COLUMN,ROW) ! Last framing row
      1444      FORMAT(T11,I3,' 20R')
*
                ELSEIF (CE.EQ..TRUE.) THEN
*
                WRITE(30,*) 'THE CE MODELING OPTION IS NOT AVAILABLE.'
*
                ENDIF
                ENDIF
                ENDIF
      1890      CONTINUE
      1900      CONTINUE
*
*
      FMN=6000
      BPMN=3000
      BPRAFLAG=.FALSE.
      CRAFLAG=.FALSE.
      APSRAFLAG=.FALSE.
      PLAINFLAG=.FALSE.
* Write the specifications for the fuel rod universes that are
* required to fill the assembly layout specification previously defined.
      DO 2845 ROW=1,50
        DO 2844 COLUMN=1,50

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 210 of 647

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*   Write the fuel rod universe specification for the assembly if it
*   contains a unique fuel material and upper region combination.
*
      IF (FUNIQUE(COLUMN,ROW).EQ..TRUE.) THEN
*   Write the fuel rod specification header.
      WRITE(30,1911)
1911  FORMAT(T1,'C')
      WRITE(30,1912) ASSYID(COLUMN,ROW)
1912  FORMAT(T1,
      C  'C FUEL ROD UNIVERSE SPECIFICATION FOR ASSEMBLY ',A5)
      WRITE(30,1913)
1913  FORMAT(T1,'C')
*   Determine what upper region specification is to be used
*   (i.e. base fuel assembly, BPRA, CRA, APSRA).
*   Determine whether or not this assembly contains a BPRA, CRA, or APSRA.
      BPRAINSERTED=.FALSE.
      CRAINSERTED=.FALSE.
      APSRAINSERTED=.FALSE.
      IF (BANKNUM(COLUMN,ROW).NE.0) THEN
        IF (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'BPRA ') THEN
          BPRAINSERTED=.TRUE.
        ELSEIF (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'CRA ') THEN
          CRAINSERTED=.TRUE.
        ELSEIF (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'APSRA') THEN
          APSRAINSERTED=.TRUE.
        ENDIF
      ENDIF
      DO 1920 MCNPNODE=1,NUMOFMCNPFUELNODES(DESNUM(COLUMN,ROW))
*   Define the fuel node bounding surfaces.
      IF (MCNPNODE.EQ.1) THEN
        TOTFUELHEIGHT=0.0
        DO 1914 Z=1,NUMOFMCNPFUELNODES(DESNUM(COLUMN,ROW))
          TOTFUELHEIGHT=TOTFUELHEIGHT+
      C  MCNPFUELHEIGHT(DESNUM(COLUMN,ROW),Z)
1914  CONTINUE
          CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)+
      C  TOTFUELHEIGHT
          CURRENTSURFLABEL=0
          DO 1915 V=1,(SN-1)
            IF (SURFTYPESPEC(V).EQ.'PZ') THEN
              IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                CURRENTSURFLABEL=V
                EXIT
              ENDIF
            ENDIF
          CONTINUE
1915  IF (CURRENTSURFLABEL.EQ.0) THEN
            TOPNODETOPSURF=SN
            SURFTYPESPEC(SN)='PZ'
            SURFVALUESPEC(SN)=CURRENTSURF
            SN=SN+1
          ELSE
            TOPNODETOPSURF=CURRENTSURFLABEL
          ENDIF
        ENDIF
      ENDIF

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 211 of 647

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      NODETOPSURF=TOPNODETOPSURF
      CURRENTSURF=SURFVALUESPEC (NODETOPSURF) -
c      MCNPFUELHEIGHT (DESNUM (COLUMN, ROW) , MCNPNODE)
      CURRENTSURFLABEL=0
      DO 1916 V=1, (SN-1)
          IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
      IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
      ENDIF
      ENDIF
1916      CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          NODEBOTTOMSURF=SN
          SURFTYPESPEC (SN) = 'PZ'
          SURFVALUESPEC (SN) =CURRENTSURF
          SN=SN+1
      ELSE
          NODEBOTTOMSURF=CURRENTSURFLABEL
      ENDIF
      CURRENTSURF=FUELRADIUS (DESNUM (COLUMN, ROW) )
      CURRENTSURFLABEL=0
      DO 1917 V=1, (SN-1)
          IF (SURFTYPESPEC (V) .EQ. 'CZ') THEN
      IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
      ENDIF
      ENDIF
1917      CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          RADIUS=SN
          SURFTYPESPEC (SN) = 'CZ'
          SURFVALUESPEC (SN) =CURRENTSURF
          SN=SN+1
      ELSE
          RADIUS=CURRENTSURFLABEL
      ENDIF
      ELSEIF (MCNPNODE.NE.1) THEN
          NODETOPSURF=NODEBOTTOMSURF
          CURRENTSURF=SURFVALUESPEC (NODETOPSURF) -
c      MCNPFUELHEIGHT (DESNUM (COLUMN, ROW) , MCNPNODE)
          CURRENTSURFLABEL=0
          DO 1918 V=1, (SN-1)
              IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
      IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
      ENDIF
      ENDIF
1918      CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          NODEBOTTOMSURF=SN
          SURFTYPESPEC (SN) = 'PZ'

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 212 of 647

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                SURFVALUESPEC (SN) =CURRENTSURF
                SN=SN+1
            ELSE
                NODEBOTTOMSURF=CURRENTSURFLABEL
            ENDIF
        ENDIF
        FUELNODEML=FMN
        FMN=FMN+1
    *   Write the fuel node cells in this fuel rod universe.
        WRITE(30,1919) LN, FUELNODEML,
    c   (-1*FUELNODEDEN(COLUMN,ROW,MCNPNODE)), (-1*RADIUS),
    c   (-1*NODETOPSURF), NODEBOTTOMSURF, FRUNIV(COLUMN,ROW),
    c   MCNPNODE
1919   FORMAT(T1,I4,T6,I4,T11,G14.6,T25,I4,1X,I4,1X,I4,
    c   ' IMP:N=1 U=',I3,' $ Fuel node ',I2)
        LN=LN+1
1920   CONTINUE
    *   Define the fuel rod cladding inner radius.
        CURRENTSURF=CLADRADIUS(DESNUM(COLUMN,ROW),1)
        CURRENTSURFLABEL=0
        DO 1921 V=1,(SN-1)
            IF (SURFTYPESPEC(V).EQ.'CZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
1921   CONTINUE
            IF (CURRENTSURFLABEL.EQ.0) THEN
                CLADIRSURF=SN
                SURFTYPESPEC(SN)='CZ'
                SURFVALUESPEC(SN)=CURRENTSURF
                SN=SN+1
            ELSE
                CLADIRSURF=CURRENTSURFLABEL
            ENDIF
    *   Define the fuel rod cladding outer radius.
        CURRENTSURF=CLADRADIUS(DESNUM(COLUMN,ROW),2)
        CURRENTSURFLABEL=0
        DO 1922 V=1,(SN-1)
            IF (SURFTYPESPEC(V).EQ.'CZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
1922   CONTINUE
            IF (CURRENTSURFLABEL.EQ.0) THEN
                CLADORSURF=SN
                SURFTYPESPEC(SN)='CZ'
                SURFVALUESPEC(SN)=CURRENTSURF
                SN=SN+1
            ELSE
                CLADORSURF=CURRENTSURFLABEL

```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 213 of 647

```

      ENDIF
*   Define the fuel rod cladding top surface.
      CURRENTSURF=TOTFUELHEIGHT+
c     ENDFITHEIGHT (DESNUM (COLUMN, ROW) , 2) +
c     ASSYPLENUM (DESNUM (COLUMN, ROW) , 1) -
c     ENDCAPHEIGHT (DESNUM (COLUMN, ROW) , 1)
      CURRENTSURFLABEL=0
      DO 1923 V=1, (SN-1)
        IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
      IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
        ENDIF
      ENDIF
1923   CONTINUE
      IF (CURRENTSURFLABEL .EQ. 0) THEN
        CLADTOPSURF=SN
        SURFTYPESPEC (SN)='PZ'
        SURFVALUESPEC (SN)=CURRENTSURF
        SN=SN+1
      ELSE
        CLADTOPSURF=CURRENTSURFLABEL
      ENDIF
*   Define the fuel rod cladding bottom surface.
      CURRENTSURF=ENDFITHEIGHT (DESNUM (COLUMN, ROW) , 2) -
c     ASSYPLENUM (DESNUM (COLUMN, ROW) , 2) +
c     ENDCAPHEIGHT (DESNUM (COLUMN, ROW) , 2)
      CURRENTSURFLABEL=0
      DO 1924 V=1, (SN-1)
        IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
      IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
        ENDIF
      ENDIF
1924   CONTINUE
      IF (CURRENTSURFLABEL .EQ. 0) THEN
        CLADBOTTOMSURF=SN
        SURFTYPESPEC (SN)='PZ'
        SURFVALUESPEC (SN)=CURRENTSURF
        SN=SN+1
      ELSE
        CLADBOTTOMSURF=CURRENTSURFLABEL
      ENDIF
*   Define the fuel rod upper plenum top surface.
      CURRENTSURF=TOTFUELHEIGHT+
c     ENDFITHEIGHT (DESNUM (COLUMN, ROW) , 2) +
c     ASSYPLENUM (DESNUM (COLUMN, ROW) , 1)
      CURRENTSURFLABEL=0
      DO 1925 V=1, (SN-1)
        IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
      IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
        ENDIF
      ENDIF

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 214 of 647

```

                ENDIF
                ENDIF
1925          CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    PLENUMTOPSURF=SN
                    SURFTYPESPEC(SN)='PZ'
                    SURFVALUESPEC(SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    PLENUMTOPSURF=CURRENTSURFLABEL
                ENDIF
*          Define the fuel rod lower plenum bottom surface.
                CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)-
c          ASSYPLENUM(DESNUM(COLUMN,ROW),2)
                CURRENTSURFLABEL=0
                DO 1926 V=1,(SN-1)
                    IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
                ENDIF
1926          CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    PLENUMBOTTOMSURF=SN
                    SURFTYPESPEC(SN)='PZ'
                    SURFVALUESPEC(SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    PLENUMBOTTOMSURF=CURRENTSURFLABEL
                ENDIF
*          Define the upper end-fitting bottom surface.
                CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),1)+
c          ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
                CURRENTSURFLABEL=0
                DO 1927 V=1,(SN-1)
                    IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
                ENDIF
1927          CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    UEFBOTTOMSURF=SN
                    SURFTYPESPEC(SN)='PZ'
                    SURFVALUESPEC(SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    UEFBOTTOMSURF=CURRENTSURFLABEL
                ENDIF
*          Define the upper end-fitting top surface.
                CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),1)+
c          ENDFITHEIGHT(DESNUM(COLUMN,ROW),1)+

```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 216 of 647

```

                                CLADMLUNIQUE=.FALSE.
                                LEAVE=.TRUE.
                                CLADML(COLUMN,ROW)=CLADML(CO,RO)
                                EXIT
                                ENDIF
                                ENDIF
1932      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
1933      CONTINUE
          ENDIF
          ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
            DO 1935 RO=1,(ROW-1)
              DO 1934 CO=1,50
                IF (DESNM(CO,RO).NE.0) THEN
                  IF (CLADMATERIAL(DESNM(COLUMN,ROW)).EQ.
                    CLADMATERIAL(DESNM(CO,RO))) THEN
                    CLADMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    CLADML(COLUMN,ROW)=CLADML(CO,RO)
                    EXIT
                  ENDIF
                ENDIF
            ENDIF
1934      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
1935      CONTINUE
          ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
            DO 1937 RO=1,1
              DO 1936 CO=1,(COLUMN-1)
                IF (DESNM(CO,RO).NE.0) THEN
                  IF (CLADMATERIAL(DESNM(COLUMN,ROW)).EQ.
                    CLADMATERIAL(DESNM(CO,RO))) THEN
                    CLADMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    CLADML(COLUMN,ROW)=CLADML(CO,RO)
                    EXIT
                  ENDIF
                ENDIF
            ENDIF
1936      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
1937      CONTINUE
          ENDIF
          IF (CLADMLUNIQUE.EQ..TRUE.) THEN
            CLADML(COLUMN,ROW)=MN
* Check Fuel Rod Cladding
            IF (CLADMATERIAL(DESNM(COLUMN,ROW)).EQ.1) THEN
              DO 1943 C=1,2
                IF (C.EQ.1) THEN
                  WRITE(200,9300) CLADML(COLUMN,ROW)

```

Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 217 of 647

```
9300          FORMAT(T1,'M',I4,T9,' 8016.50c   -0.120',
c              '$ Zirc-4 Cladding')
              ELSEIF (C.EQ.2) THEN
                WRITE(200,9301)
9301          FORMAT(T9,'24050.60c   -0.004')
                WRITE(200,7000)
7000          FORMAT(T9,'24052.60c   -0.084')
                WRITE(200,7001)
7001          FORMAT(T9,'24053.60c   -0.010')
                WRITE(200,7002)
7002          FORMAT(T9,'24054.60c   -0.002')
                WRITE(200,9302)
9302          FORMAT(T9,'26054.60c   -0.011')
                WRITE(200,7003)
7003          FORMAT(T9,'26056.60c   -0.184')
                WRITE(200,7004)
7004          FORMAT(T9,'26057.60c   -0.004')
                WRITE(200,7005)
7005          FORMAT(T9,'26058.60c   -0.001')
                WRITE(200,9303)
9303          FORMAT(T9,'40000.60c   -98.180')
                WRITE(200,9304)
9304          FORMAT(T9,'50000.35c   -1.400')
              ENDIF
1943          CONTINUE
              ELSEIF (CLADMATERIAL(DESNUM(COLUMN,ROW))
c              .EQ.2) THEN
                DO 1948 C=1,2
                  IF (C.EQ.1) THEN
                    WRITE(200,9305) CLADML(COLUMN,ROW)
9305          FORMAT(T1,'M',I4,T9,'6000.50c   -0.080',
c              '$ SS304 Cladding')
                    ELSEIF (C.EQ.2) THEN
                      WRITE(200,9306)
9306          FORMAT(T9,'7014.50c   -0.100')
                      WRITE(200,9307)
9307          FORMAT(T9,'14000.50c   -0.750')
                      WRITE(200,9308)
9308          FORMAT(T9,'15031.50c   -0.045')
                      WRITE(200,9309)
9309          FORMAT(T9,'16032.50c   -0.030')
                      WRITE(200,9310)
9310          FORMAT(T9,'24050.60c   -0.793')
                      WRITE(200,7006)
7006          FORMAT(T9,'24052.60c   -15.903')
                      WRITE(200,7007)
7007          FORMAT(T9,'24053.60c   -1.838')
                      WRITE(200,7008)
7008          FORMAT(T9,'24054.60c   -0.466')
                      WRITE(200,9311)
9311          FORMAT(T9,'25055.50c   -2.000')
                      WRITE(200,9312)
9312          FORMAT(T9,'26054.60c   -3.918')
                      WRITE(200,7009)
```

Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 218 of 647

```
7009          FORMAT(T9, '26056.60c      -63.156')
              WRITE(200,7010)
7010          FORMAT(T9, '26057.60c      -1.472')
              WRITE(200,7011)
7011          FORMAT(T9, '26058.60c      -0.200')
              WRITE(200,9313)
9313          FORMAT(T9, '28058.60c      -6.234')
              WRITE(200,7012)
7012          FORMAT(T9, '28060.60c      -2.465')
              WRITE(200,7013)
7013          FORMAT(T9, '28061.60c      -0.109')
              WRITE(200,7014)
7014          FORMAT(T9, '28062.60c      -0.350')
              WRITE(200,7015)
7015          FORMAT(T9, '28064.60c      -0.092')
              ENDIF
1948          CONTINUE
              ELSEIF (CLADMATERIAL(DESDNUM(COLUMN,ROW))
c              .EQ.3) THEN
              DO 1954 C=1,2
              IF (C.EQ.1) THEN
              WRITE(200,9314) CLADML(COLUMN,ROW)
9314          FORMAT(T1, 'M', I4, T9, '6000.50c      -0.080',
c              '
              $ Inconel Cladding')
              ELSEIF (C.EQ.2) THEN
              WRITE(200,9315)
9315          FORMAT(T9, '14000.50c      -0.350')
              WRITE(200,9316)
9316          FORMAT(T9, '15031.50c      -0.015')
              WRITE(200,9317)
9317          FORMAT(T9, '16032.50c      -0.015')
              WRITE(200,9318)
9318          FORMAT(T9, '24050.60c      -0.793')
              WRITE(200,7016)
7016          FORMAT(T9, '24052.60c      -15.903')
              WRITE(200,7017)
7017          FORMAT(T9, '24053.60c      -1.838')
              WRITE(200,7018)
7018          FORMAT(T9, '24054.60c      -0.466')
              WRITE(200,9319)
9319          FORMAT(T9, '25055.50c      -0.350')
              WRITE(200,9320)
9320          FORMAT(T9, '26054.60c      -0.958')
              WRITE(200,7019)
7019          FORMAT(T9, '26056.60c      -15.442')
              WRITE(200,7020)
7020          FORMAT(T9, '26057.60c      -0.360')
              WRITE(200,7021)
7021          FORMAT(T9, '26058.60c      -0.049')
              WRITE(200,9321)
9321          FORMAT(T9, '28058.60c      -35.382')
              WRITE(200,7022)
7022          FORMAT(T9, '28060.60c      -13.993')
              WRITE(200,7023)
```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 221 of 647

```

        LEAVE=.TRUE.
        FRUPML(COLUMN,ROW)=FRUPML(CO,RO)
        EXIT
    ENDIF
    ENDIF
2156    CONTINUE
        IF (LEAVE.EQ..TRUE.) THEN
            EXIT
        ENDIF
2157    CONTINUE
    ENDIF
        IF (FRUPMLUNIQUE.EQ..TRUE.) THEN
            FRUPML(COLUMN,ROW)=MN
*   Check Fuel Rod Upper Plenum Regions
            DO 2160 C=1,FRUPLENMAT(DESNUM(COLUMN,ROW),2)
                IF (C.EQ.1) THEN
                    WRITE(200,2158) FRUPML(COLUMN,ROW),
                    FRUPLENZAIDS(DESNUM(COLUMN,ROW),C),
                    (-1*FRUPLENWTS(DESNUM(COLUMN,ROW),C))
2158    FORMAT(T1,'M',I4,T9,A9,3X,G14.6,
                    ' $ Fuel Rod Upper Plenum')
                ELSE
                    WRITE(200,2159)
                    FRUPLENZAIDS(DESNUM(COLUMN,ROW),C),
                    (-1*FRUPLENWTS(DESNUM(COLUMN,ROW),C))
2159    FORMAT(T9,A9,3X,G14.6)
                ENDIF
            CONTINUE
2160    MN=MN+1
        ENDIF
        WRITE(30,2190) LN, FRUPML(COLUMN,ROW),
        (-1*FRUPLENMAT(DESNUM(COLUMN,ROW),1)), TOPNODETOPSURF,
        (-1*PLENUMTOPSURF), (-1*CLADIRSURF), FRUNIV(COLUMN,ROW)
2190    FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
        ' IMP:N=1 U=',I3,' $ Fuel rod upper plenum')
        LN=LN+1
        WRITE(30,2200) LN, FRUPML(COLUMN,ROW),
        (-1*FRUPLENMAT(DESNUM(COLUMN,ROW),1)), CLADTOPSURF,
        (-1*PLENUMTOPSURF), CLADIRSURF, (-1*CLADORSURF),
        FRUNIV(COLUMN,ROW)
2200    FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
        ' IMP:N=1 U=',I3,' $ Fuel rod upper plenum')
        LN=LN+1
*   Write the fuel rod lower plenum cell in this fuel rod universe.
*   Determine if the fuel rod lower plenum material specification has
*   previously been defined.  If it has been previously defined, determine
*   the lower plenum material specification label.
        FRLPMLUNIQUE=.TRUE.
        LEAVE=.FALSE.
        IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
            DO 2211 RO=1,(ROW-1)
                DO 2210 CO=1,50
                    IF (DESNUM(CO,RO).NE.0) THEN
                        IF (DESNUM(COLUMN,ROW).EQ.DESNUM(CO,RO)) THEN

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 222 of 647

```

                FRLPMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                FRLPML(COLUMN,ROW)=FRLPML(CO,RO)
                EXIT
            ENDIF
        ENDIF
2210        CONTINUE
            IF (LEAVE.EQ..TRUE.) THEN
                EXIT
            ENDIF
2211        CONTINUE
            IF (LEAVE.EQ..FALSE.) THEN
                DO 2213 RO=ROW,ROW
                    DO 2212 CO=1,(COLUMN-1)
                        IF (DESNUM(CO,RO).NE.0) THEN
                            IF (DESNUM(COLUMN,ROW).EQ.
                                c        DESNUM(CO,RO)) THEN
                                    FRLPMLUNIQUE=.FALSE.
                                    LEAVE=.TRUE.
                                    FRLPML(COLUMN,ROW)=FRLPML(CO,RO)
                                    EXIT
                                ENDIF
                            ENDIF
2212                CONTINUE
                    IF (LEAVE.EQ..TRUE.) THEN
                        EXIT
                    ENDIF
2213                CONTINUE
            ENDIF
            ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
                DO 2215 RO=1,(ROW-1)
                    DO 2214 CO=1,50
                        IF (DESNUM(CO,RO).NE.0) THEN
                            IF (DESNUM(COLUMN,ROW).EQ.
                                c        DESNUM(CO,RO)) THEN
                                    FRLPMLUNIQUE=.FALSE.
                                    LEAVE=.TRUE.
                                    FRLPML(COLUMN,ROW)=FRLPML(CO,RO)
                                    EXIT
                                ENDIF
                            ENDIF
2214                CONTINUE
                    IF (LEAVE.EQ..TRUE.) THEN
                        EXIT
                    ENDIF
2215                CONTINUE
            ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
                DO 2217 RO=1,1
                    DO 2216 CO=1,(COLUMN-1)
                        IF (DESNUM(CO,RO).NE.0) THEN
                            IF (DESNUM(COLUMN,ROW).EQ.
                                c        DESNUM(CO,RO)) THEN
                                    FRLPMLUNIQUE=.FALSE.
                                    LEAVE=.TRUE.

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 223 of 647

```

                FRLPML (COLUMN, ROW) = FRLPML (CO, RO)
                EXIT
            ENDIF
        ENDIF
2216        CONTINUE
            IF (LEAVE.EQ..TRUE.) THEN
                EXIT
            ENDIF
2217        CONTINUE
        ENDIF
            IF (FRLPMLUNIQUE.EQ..TRUE.) THEN
                FRLPML (COLUMN, ROW) = MN
* Check Fuel Rod Lower Plenum Regions
                DO 2220 C=1, FRLPLENMAT (DESNUM (COLUMN, ROW), 2)
                    IF (C.EQ.1) THEN
                        WRITE (200, 2218) FRLPML (COLUMN, ROW),
                            FRLPLENZ AIDS (DESNUM (COLUMN, ROW), C),
                            (-1 * FRLPLENWTS (DESNUM (COLUMN, ROW), C))
2218                FORMAT (T1, 'M', I4, T9, A9, 3X, G14.6,
                    ' $ Fuel Rod Lower Plenum')
                    ELSE
                        WRITE (200, 2219)
                            FRLPLENZ AIDS (DESNUM (COLUMN, ROW), C),
                            (-1 * FRLPLENWTS (DESNUM (COLUMN, ROW), C))
2219                FORMAT (T9, A9, 3X, G14.6)
                    ENDIF
                CONTINUE
                MN = MN + 1
            ENDIF
            WRITE (30, 2250) LN, FRLPML (COLUMN, ROW),
                (-1 * FRLPLENMAT (DESNUM (COLUMN, ROW), 1)), PLENUMBOTTOMSURF,
                (-1 * NODEBOTTOMSURF), (-1 * CLADIRSURF), FRUNIV (COLUMN, ROW)
2250        FORMAT (T1, I4, T6, I4, T11, F8.5, T25, I4, 1X, I4, 1X, I4,
            ' IMP:N=1 U=', I3, ' $ Fuel rod lower plenum')
            LN = LN + 1
            WRITE (30, 2260) LN, FRLPML (COLUMN, ROW),
                (-1 * FRLPLENMAT (DESNUM (COLUMN, ROW), 1)), PLENUMBOTTOMSURF,
                (-1 * CLADBOTTOMSURF), CLADIRSURF, (-1 * CLADORSURF),
                FRUNIV (COLUMN, ROW)
2260        FORMAT (T1, I4, T6, I4, T11, F8.5, T25, I4, 1X, I4, 1X, I4, 1X, I4,
            ' IMP:N=1 U=', I3, ' $ Fuel rod lower plenum')
            LN = LN + 1
* Write the lower end-fitting cell specification for this fuel rod
universe.
* Determine if the fuel rod lower end-fitting material specification has
* previously been defined. If it has been previously defined, determine
* the lower end-fitting material specification label.
            FRLEFMLUNIQUE = .TRUE.
            LEAVE = .FALSE.
            IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
                DO 2271 RO=1, (ROW-1)
                    DO 2270 CO=1, 50
                        IF (DESNUM (CO, RO).NE.0) THEN
                            IF (DESNUM (COLUMN, ROW).EQ.DESNUM (CO, RO)) THEN

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 224 of 647

```
FRLEFMLUNIQUE=.FALSE.
LEAVE=.TRUE.
FRLEFML(COLUMN,ROW)=FRLEFML(CO,RO)
EXIT
ENDIF
ENDIF
2270 CONTINUE
IF (LEAVE.EQ..TRUE.) THEN
EXIT
ENDIF
2271 CONTINUE
IF (LEAVE.EQ..FALSE.) THEN
DO 2273 RO=ROW,ROW
DO 2272 CO=1,(COLUMN-1)
IF (DESNUM(CO,RO).NE.0) THEN
IF (DESNUM(COLUMN,ROW).EQ.
c DESNUM(CO,RO)) THEN
FRLEFMLUNIQUE=.FALSE.
LEAVE=.TRUE.
FRLEFML(COLUMN,ROW)=FRLEFML(CO,RO)
EXIT
ENDIF
ENDIF
2272 CONTINUE
IF (LEAVE.EQ..TRUE.) THEN
EXIT
ENDIF
2273 CONTINUE
ENDIF
ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
DO 2275 RO=1,(ROW-1)
DO 2274 CO=1,50
IF (DESNUM(CO,RO).NE.0) THEN
IF (DESNUM(COLUMN,ROW).EQ.
c DESNUM(CO,RO)) THEN
FRLEFMLUNIQUE=.FALSE.
LEAVE=.TRUE.
FRLEFML(COLUMN,ROW)=FRLEFML(CO,RO)
EXIT
ENDIF
ENDIF
2274 CONTINUE
IF (LEAVE.EQ..TRUE.) THEN
EXIT
ENDIF
2275 CONTINUE
ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
DO 2277 RO=1,1
DO 2276 CO=1,(COLUMN-1)
IF (DESNUM(CO,RO).NE.0) THEN
IF (DESNUM(COLUMN,ROW).EQ.
c DESNUM(CO,RO)) THEN
FRLEFMLUNIQUE=.FALSE.
LEAVE=.TRUE.
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 225 of 647

```

                FRLEFML (COLUMN, ROW) =FRLEFML (CO, RO)
                EXIT
            ENDIF
        ENDIF
2276        CONTINUE
            IF (LEAVE.EQ..TRUE.) THEN
                EXIT
            ENDIF
2277        CONTINUE
        ENDIF
        IF (FRLEFMLUNIQUE.EQ..TRUE.) THEN
            FRLEFML (COLUMN, ROW) =MN
* Check Fuel Rod Lower End-Fitting Regions
            DO 2280 C=1, LEFMAT (DESNUM (COLUMN, ROW), 2)
                IF (C.EQ.1) THEN
                    WRITE (200, 2278) FRLEFML (COLUMN, ROW),
c                    LEFZAIDS (DESNUM (COLUMN, ROW), C),
c                    (-1*LEFWTS (DESNUM (COLUMN, ROW), C))
2278        FORMAT (T1, 'M', I4, T9, A9, 3X, G14.6,
c                    '$ Fuel Rod Lower End Fitting')
                ELSE
                    WRITE (200, 2279) LEFZAIDS (DESNUM (COLUMN, ROW), C),
c                    (-1*LEFWTS (DESNUM (COLUMN, ROW), C))
2279        FORMAT (T9, A9, 3X, G14.6)
                ENDIF
            CONTINUE
2280        WRITE (200, 2281) FRLEFML (COLUMN, ROW)
2281        FORMAT (T1, 'MT', I4, T9, 'LWTR.03T')
            MN=MN+1
        ENDIF
        IF ((SURFVALUESPEC (PLENUMBOTTOMSURF).GT.(0.0)).AND.
c        (SURFVALUESPEC (PLENUMBOTTOMSURF).LT.
c        SURFVALUESPEC (NODEBOTTOMSURF))) THEN
            WRITE (30, 2285) LN, FRLEFML (COLUMN, ROW),
c            (-1*LEFMAT (DESNUM (COLUMN, ROW), 1)), (-1*NODEBOTTOMSURF),
c            CLADORSURF, FRUNIV (COLUMN, ROW)
2285        FORMAT (T1, I4, T6, I4, T11, F8.5, T25, I4, 1X, I4,
c            ' IMP:N=1 U=', I3, '$ Assembly lower end-fitting')
            LN=LN+1
            WRITE (30, 2290) LN, FRLEFML (COLUMN, ROW),
c            (-1*LEFMAT (DESNUM (COLUMN, ROW), 1)), (-1*PLENUMBOTTOMSURF),
c            (-1*CLADORSURF), FRUNIV (COLUMN, ROW)
2290        FORMAT (T1, I4, T6, I4, T11, F8.5, T25, I4, 1X, I4,
c            ' IMP:N=1 U=', I3, '$ Assembly lower end-fitting')
            LN=LN+1
        ELSEIF (SURFVALUESPEC (PLENUMBOTTOMSURF).LT.(0.0)) THEN
            WRITE (30, 2295) LN, FRLEFML (COLUMN, ROW),
c            (-1*LEFMAT (DESNUM (COLUMN, ROW), 1)), (-1*NODEBOTTOMSURF),
c            CLADORSURF, FRUNIV (COLUMN, ROW)
2295        FORMAT (T1, I4, T6, I4, T11, F8.5, T25, I4, 1X, I4,
c            ' IMP:N=1 U=', I3, '$ Assembly lower end-fitting')
            LN=LN+1
        ELSEIF (SURFVALUESPEC (PLENUMBOTTOMSURF).GE.
c        SURFVALUESPEC (NODEBOTTOMSURF)) THEN

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 226 of 647

```

                WRITE(30,2300) LN, FRLEFML(COLUMN,ROW),
c                (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*NODEBOTTOMSURF),
c                FRUNIV(COLUMN,ROW)
2300          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,
c                ' IMP:N=1 U=',I3,' $ Assembly lower end-fitting')
                LN=LN+1
            ENDIF
*   Write the upper end-fitting cell specification for this fuel rod
universe.
*   Determine if the fuel rod upper end-fitting material specification has
*   previously been defined.  If it has been previously defined, determine
*   the upper end-fitting material specification label.
                FRUEFMLUNIQUE=.TRUE.
                LEAVE=.FALSE.
                IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
                    DO 2321 RO=1,(ROW-1)
                        DO 2320 CO=1,50
                            IF (DESNUM(CO,RO).NE.0) THEN
                                IF (DESNUM(COLUMN,ROW).EQ.DESNUM(CO,RO)) THEN
                                    FRUEFMLUNIQUE=.FALSE.
                                    LEAVE=.TRUE.
                                    FRUEFML(COLUMN,ROW)=FRUEFML(CO,RO)
                                    EXIT
                                ENDIF
                            ENDIF
                        ENDIF
                    CONTINUE
                2320          IF (LEAVE.EQ..TRUE.) THEN
                    EXIT
                ENDIF
                2321          CONTINUE
                IF (LEAVE.EQ..FALSE.) THEN
                    DO 2323 RO=ROW,ROW
                        DO 2322 CO=1,(COLUMN-1)
                            IF (DESNUM(CO,RO).NE.0) THEN
                                IF (DESNUM(COLUMN,ROW).EQ.
c                                DESNUM(CO,RO)) THEN
                                    FRUEFMLUNIQUE=.FALSE.
                                    LEAVE=.TRUE.
                                    FRUEFML(COLUMN,ROW)=FRUEFML(CO,RO)
                                    EXIT
                                ENDIF
                            ENDIF
                        ENDIF
                    CONTINUE
                2322          IF (LEAVE.EQ..TRUE.) THEN
                    EXIT
                ENDIF
                2323          CONTINUE
                ENDIF
            ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
                DO 2325 RO=1,(ROW-1)
                    DO 2324 CO=1,50
                        IF (DESNUM(CO,RO).NE.0) THEN
                            IF (DESNUM(COLUMN,ROW).EQ.
c                            DESNUM(CO,RO)) THEN

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 227 of 647

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FRUEFMLUNIQUE=.FALSE.
LEAVE=.TRUE.
FRUEFML(COLUMN,ROW)=FRUEFML(CO,RO)
EXIT
ENDIF
ENDIF
2324 CONTINUE
IF (LEAVE.EQ..TRUE.) THEN
EXIT
ENDIF
2325 CONTINUE
ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
DO 2327 RO=1,1
DO 2326 CO=1,(COLUMN-1)
IF (DESNUM(CO,RO).NE.0) THEN
IF (DESNUM(COLUMN,ROW).EQ.
c DESNUM(CO,RO)) THEN
FRUEFMLUNIQUE=.FALSE.
LEAVE=.TRUE.
FRUEFML(COLUMN,ROW)=FRUEFML(CO,RO)
EXIT
ENDIF
ENDIF
2326 CONTINUE
IF (LEAVE.EQ..TRUE.) THEN
EXIT
ENDIF
2327 CONTINUE
ENDIF
IF (FRUEFMLUNIQUE.EQ..TRUE.) THEN
FRUEFML(COLUMN,ROW)=MN
* Check Fuel Rod Upper End-Fitting Regions
DO 2330 C=1,UEFMAT(DESNUM(COLUMN,ROW),2)
IF (C.EQ.1) THEN
WRITE(200,2328) FRUEFML(COLUMN,ROW),
c UEFZAIDS(DESNUM(COLUMN,ROW),C),
c (-1*UEFWTS(DESNUM(COLUMN,ROW),C))
2328 FORMAT(T1,'M',I4,T9,A9,3X,G14.6,
c '$ Fuel Rod Upper End Fitting')
ELSE
WRITE(200,2329) UEFZAIDS(DESNUM(COLUMN,ROW),C),
c (-1*UEFWTS(DESNUM(COLUMN,ROW),C))
2329 FORMAT(T9,A9,3X,G14.6)
ENDIF
2330 CONTINUE
WRITE(200,2331) FRUEFML(COLUMN,ROW)
2331 FORMAT(T1,'MT',I4,T9,'LWTR.03T')
MN=MN+1
ENDIF
IF (SURFVALUESPEC(PLENUMTOPSURF).LT.
c SURFVALUESPEC(UEFBOTTOMSURF)) THEN
WRITE(30,2333) LN, FRUEFML(COLUMN,ROW),
c (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c (-1*UEFTOPSURF), FRUNIV(COLUMN,ROW)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 228 of 647

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2333          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c            ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
          LN=LN+1
          ELSEIF ((SURFVALUESPEC(PLENUMTOPSURF).GT.
c            SURFVALUESPEC(UEFBOTTOMSURF)).AND.
c            (SURFVALUESPEC(PLENUMTOPSURF).LT.
c            SURFVALUESPEC(UEFTOPSURF))) THEN
          WRITE(30,2335) LN, FRUEFML(COLUMN,ROW),
c            (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c            (-1*UEFTOPSURF), CLADORSURF, FRUNIV(COLUMN,ROW)
2335          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c            ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
          LN=LN+1
          WRITE(30,2340) LN, FRUEFML(COLUMN,ROW),
c            (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), PLENUMTOPSURF,
c            (-1*UEFTOPSURF), (-1*CLADORSURF), FRUNIV(COLUMN,ROW)
2340          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c            ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
          LN=LN+1
          ELSEIF (SURFVALUESPEC(PLENUMTOPSURF).EQ.
c            SURFVALUESPEC(UEFBOTTOMSURF)) THEN
          WRITE(30,2345) LN, FRUEFML(COLUMN,ROW),
c            (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c            (-1*UEFTOPSURF), FRUNIV(COLUMN,ROW)
2345          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c            ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
          LN=LN+1
          ELSEIF (SURFVALUESPEC(PLENUMTOPSURF).EQ.
c            SURFVALUESPEC(UEFTOPSURF)) THEN
          WRITE(30,2350) LN, FRUEFML(COLUMN,ROW),
c            (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c            (-1*UEFTOPSURF), CLADORSURF, FRUNIV(COLUMN,ROW)
2350          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c            ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
          LN=LN+1
          ENDIF
*      Loop through the regions above the fuel rod (i.e. the appropriate upper
core regions)
*      Define the upper region lower surface.
          IF (BPRAINSERTED.EQ..TRUE.) THEN
              DO 2450 REGION=1,NUMREGABOVEBPRA
*      Determine the current upper region's lower surface specification.
              IF (REGION.EQ.1) THEN
                  REGIONTOPSURF=SYSTEMTOP
                  CURRENTSURF=SURFVALUESPEC(SYSTEMTOP)-
c                REGABOVEBPRA(REGION,1)
                  ENDIF
c                CURRENTSURF=SURFVALUESPEC(REGIONTOPSURF)-
REGABOVEBPRA(REGION,1)
              IF (REGION.EQ.NUMREGABOVEBPRA) THEN
                  REGIONBOTTOMSURF=UEFTOPSURF
              ELSE
                  CURRENTSURFLABEL=0
                  DO 2370 V=1,(SN-1)

```


Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 230 of 647

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                LEAVE=.TRUE.
                EXIT
                ENDIF
2380            CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                EXIT
                ENDIF
2381            CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                EXIT
                ENDIF
2382            CONTINUE
                IF (LEAVE.EQ..FALSE.) THEN
                DO 2385 RO=ROW,ROW
                DO 2384 CO=1,(COLUMN-1)
                DO 2383 BN=1,NUMOFBANKS
                IF ((BANKNUM(CO,RO).NE.
c                0).AND.
c                (BANKDES(BANKNUM(CO,RO)).EQ.
c                'BPRA ')) THEN
                FRUREGIONML(COLUMN,ROW,REGION)=
c                FRUREGIONML(CO,RO,REGION)
                LEAVE=.TRUE.
                EXIT
                ENDIF
2383            CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                EXIT
                ENDIF
2384            CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                EXIT
                ENDIF
2385            CONTINUE
                ENDIF
                ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
                LEAVE=.FALSE.
                DO 2388 RO=1,(ROW-1)
                DO 2387 CO=1,50
                DO 2386 BN=1,NUMOFBANKS
                IF ((BANKNUM(CO,RO).NE.0)
c                .AND.(BANKDES(BANKNUM(CO,RO)).EQ.
c                'BPRA ')) THEN
                FRUREGIONML(COLUMN,ROW,REGION)=
c                FRUREGIONML(CO,RO,REGION)
                LEAVE=.TRUE.
                EXIT
                ENDIF
2386            CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                EXIT
                ENDIF
2387            CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 231 of 647

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                EXIT
                ENDIF
2388          CONTINUE
                ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
                LEAVE=.FALSE.
                DO 2391 RO=1,1
                DO 2390 CO=1,(COLUMN-1)
                DO 2389 BN=1,NUMOFBANKS
                IF ((BANKNUM(CO,RO).NE.0)
                c          .AND.(BANKDES(BANKNUM(CO,RO)).EQ.
                c          'BPRA ')) THEN
                c          FRUREGIONML(COLUMN,ROW,REGION)=
                FRUREGIONML(CO,RO,REGION)
                LEAVE=.TRUE.
                EXIT
                ENDIF
2389          CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                EXIT
                ENDIF
2390          CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                EXIT
                ENDIF
2391          CONTINUE
                ENDIF
                ENDIF
*          Write the cell specification for the fuel rod universe upper region.
                IF (REGION.EQ.1) THEN
                WRITE(30,2440) LN, FRUREGIONML(COLUMN,ROW,REGION),
                c          (-1*REGABOVEBPRA(REGION,2)),
                c          REGIONBOTTOMSURF, FRUNIV(COLUMN,ROW), REGION
2440          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,
                c          ' IMP:N=1 U=',I3,' $ Upper-core region ',I2)
                LN=LN+1
                REGIONTOPSURF=REGIONBOTTOMSURF
                ELSE
                WRITE(30,2445) LN, FRUREGIONML(COLUMN,ROW,REGION),
                c          (-1*REGABOVEBPRA(REGION,2)), (-1*REGIONTOPSURF),
                c          REGIONBOTTOMSURF, FRUNIV(COLUMN,ROW), REGION
2445          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
                c          ' IMP:N=1 U=',I3,' $ Upper-core region ',I2)
                LN=LN+1
                REGIONTOPSURF=REGIONBOTTOMSURF
                ENDIF
2450          CONTINUE
                BPRAFLAG=.TRUE.
                ELSEIF (CRAINSERTED.EQ..TRUE.) THEN
                DO 2540 REGION=1,NUMREGABOVECRA
*          Determine the current upper region's lower surface specification.
                IF (REGION.EQ.1) THEN
                REGIONTOPSURF=SYSTEMTOP
                CURRENTSURF=SURFVALUESPEC(SYSTEMTOP)-
                c          REGABOVECRA(REGION,1)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 232 of 647

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                ENDIF
                CURRENTSURF=SURFVALUESPEC (REGIONTOPSURF) -
                REGABOVECRA (REGION, 1)
c              IF (REGION.EQ.NUMREGABOVECRA) THEN
                REGIONBOTTOMSURF=UEFTOPSURF
                ELSE
                CURRENTSURFLABEL=0
                DO 2460 V=1, (SN-1)
                    IF (SURFTYPESPEC (V).EQ.'PZ') THEN
                IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
                ENDIF
                CONTINUE
2460            IF (CURRENTSURFLABEL.EQ.0) THEN
                REGIONBOTTOMSURF=SN
                SURFTYPESPEC (SN)='PZ'
                SURFVALUESPEC (SN)=CURRENTSURF
                SN=SN+1
                ELSE
                REGIONBOTTOMSURF=CURRENTSURFLABEL
                ENDIF
                ENDIF
*           Determine if the fuel rod upper region material specification has
*           previously been defined.  If it has been previously defined, determine
*           the upper region material specification label.
                IF (CRAFLAG.EQ..FALSE.) THEN
                FRUREGIONMLUNIQUE=.TRUE.
                FRUREGIONML (COLUMN, ROW, REGION)=MN
*           Check Upper Core Region in the Fuel Rod Universe
                DO 2463 D=1, REGABOVECRA (REGION, 3)
                    IF (D.EQ.1) THEN
                        WRITE (200, 2461) MN,
c                          ABOVECRAZIDS (REGION, D),
c                          (-1*ABOVECRAWTS (REGION, D)), REGION,
c                          ASSYID (COLUMN, ROW)
2461                    FORMAT (T1, 'M', I4, T9, A9, 3X, G14.6,
c                          ' $ Upper Core Region ', I2,
c                          ' in Assembly ', A5)
                        ELSE
                        WRITE (200, 2462) ABOVECRAZIDS (REGION, D),
c                          (-1*ABOVECRAWTS (REGION, D))
2462                    FORMAT (T9, A9, 3X, G14.6)
                        ENDIF
                CONTINUE
2463            WRITE (200, 2464) MN
2464            FORMAT (T1, 'MT', I4, T9, 'LWTR.03T')
                MN=MN+1
                ELSE
                FRUREGIONMLUNIQUE=.FALSE.
                IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
                LEAVE=.FALSE.
                DO 2472 RO=1, (ROW-1)

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 233 of 647

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DO 2471 CO=1,50
DO 2470 BN=1,NUMOFBANKS
IF ((BANKNUM(CO,RO).NE.0)
c      .AND.(BANKDES(BANKNUM(CO,RO)).EQ.
c      'CRA ')) THEN
c      FRUREGIONML(COLUMN,ROW,REGION)=
FRUREGIONML(CO,RO,REGION)
LEAVE=.TRUE.
EXIT
ENDIF
2470 CONTINUE
IF (LEAVE.EQ..TRUE.) THEN
EXIT
ENDIF
2471 CONTINUE
IF (LEAVE.EQ..TRUE.) THEN
EXIT
ENDIF
2472 CONTINUE
IF (LEAVE.EQ..FALSE.) THEN
DO 2475 RO=ROW,ROW
DO 2474 CO=1,(COLUMN-1)
DO 2473 BN=1,NUMOFBANKS
IF ((BANKNUM(CO,RO).NE.0)
c      .AND.(BANKDES(BANKNUM(CO,RO)).EQ.
c      'CRA ')) THEN
c      FRUREGIONML(COLUMN,ROW,REGION)=
FRUREGIONML(CO,RO,REGION)
LEAVE=.TRUE.
EXIT
ENDIF
2473 CONTINUE
IF (LEAVE.EQ..TRUE.) THEN
EXIT
ENDIF
2474 CONTINUE
IF (LEAVE.EQ..TRUE.) THEN
EXIT
ENDIF
2475 CONTINUE
ENDIF
ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
LEAVE=.FALSE.
DO 2478 RO=1,(ROW-1)
DO 2477 CO=1,50
DO 2476 BN=1,NUMOFBANKS
IF ((BANKNUM(CO,RO).NE.0)
c      .AND.(BANKDES(BANKNUM(CO,RO)).EQ.
c      'CRA ')) THEN
c      FRUREGIONML(COLUMN,ROW,REGION)=
FRUREGIONML(CO,RO,REGION)
LEAVE=.TRUE.
EXIT
ENDIF
ENDIF

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 234 of 647

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2476             CONTINUE
                  IF (LEAVE.EQ..TRUE.) THEN
                      EXIT
                  ENDIF
2477             CONTINUE
                  IF (LEAVE.EQ..TRUE.) THEN
                      EXIT
                  ENDIF
2478             CONTINUE
                  ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
                      LEAVE=.FALSE.
                      DO 2481 RO=1,1
                          DO 2480 CO=1,(COLUMN-1)
                              DO 2479 BN=1,NUMOFBANKS
                                  IF ((BANKNUM(CO,RO).NE.0)
c                                     .AND.(BANKDES(BANKNUM(CO,RO)).EQ.
c                                     'CRA ')) THEN
c                                     FRUREGIONML(COLUMN,ROW,REGION)=
c                                     FRUREGIONML(CO,RO,REGION)
                                      LEAVE=.TRUE.
                                      EXIT
                                  ENDIF
2479             CONTINUE
                  IF (LEAVE.EQ..TRUE.) THEN
                      EXIT
                  ENDIF
2480             CONTINUE
                  IF (LEAVE.EQ..TRUE.) THEN
                      EXIT
                  ENDIF
2481             CONTINUE
                  ENDIF
* Write the cell specification for the fuel rod universe upper region.
                  IF (REGION.EQ.1) THEN
                      WRITE(30,2530) LN, FRUREGIONML(COLUMN,ROW,REGION),
c                                     (-1*REGABOVECRA(REGION,2)),
c                                     REGIONBOTTOMSURF, FRUNIV(COLUMN,ROW), REGION
2530             FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,
c                                     ' IMP:N=1 U=',I3,' $ Upper-core region ',I2)
                      LN=LN+1
                      REGIONTOPSURF=REGIONBOTTOMSURF
                  ELSE
                      WRITE(30,2535) LN, FRUREGIONML(COLUMN,ROW,REGION),
c                                     (-1*REGABOVECRA(REGION,2)), (-1*REGIONTOPSURF),
c                                     REGIONBOTTOMSURF, FRUNIV(COLUMN,ROW), REGION
2535             FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c                                     ' IMP:N=1 U=',I3,' $ Upper-core region ',I2)
                      LN=LN+1
                      REGIONTOPSURF=REGIONBOTTOMSURF
                  ENDIF
2540             CONTINUE
                  CRAFLAG=.TRUE.
                  ELSEIF (APSRAININSERTED.EQ..TRUE.) THEN

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 235 of 647

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DO 2630 REGION=1,NUMREGABOVEAPSRA
*   Determine the current upper region's lower surface specification.
      IF (REGION.EQ.1) THEN
          REGIONTOPSURF=SYSTEMTOP
          CURRENTSURF=SURFVALUESPEC(SYSTEMTOP)-
c         REGABOVEAPSRA(REGION,1)
          ENDIF
c         CURRENTSURF=SURFVALUESPEC(REGIONTOPSURF)-
          REGABOVEAPSRA(REGION,1)
          IF (REGION.EQ.NUMREGABOVEAPSRA) THEN
              REGIONBOTTOMSURF=UEFTOPSURF
          ELSE
              CURRENTSURFLABEL=0
              DO 2550 V=1,(SN-1)
                  IF (SURFTYPESPEC(V).EQ.'PZ') THEN
IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                      CURRENTSURFLABEL=V
                      EXIT
                  ENDIF
              ENDIF
2550      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
              REGIONBOTTOMSURF=SN
              SURFTYPESPEC(SN)='PZ'
              SURFVALUESPEC(SN)=CURRENTSURF
              SN=SN+1
          ELSE
              REGIONBOTTOMSURF=CURRENTSURFLABEL
          ENDIF
          ENDIF
*   Determine if the fuel rod upper region material specification has
*   previously been defined.  If it has been previously defined, determine
*   the upper region material specification label.
          IF (APSRAFLAG.EQ.FALSE.) THEN
              FRUREGIONMLUNIQUE=.TRUE.
              FRUREGIONML(COLUMN,ROW,REGION)=MN
*   Check Upper Core Region in the Fuel Rod Universe
          DO 2553 D=1,REGABOVEAPSRA(REGION,3)
              IF (D.EQ.1) THEN
                  WRITE(200,2551) MN,
c                 ABOVEAPSRAZADS(REGION,D),
c                 (-1*ABOVEAPSRAWTS(REGION,D)), REGION,
c                 ASSYID(COLUMN,ROW)
2551      FORMAT(T1,'M',I4,T9,A9,3X,G14.6,
c                 '$ Upper Core Region ',I2,
c                 ' in Assembly ', A5)
              ELSE
                  WRITE(200,2552) ABOVEAPSRAZADS(REGION,D),
c                 (-1*ABOVEAPSRAWTS(REGION,D))
2552      FORMAT(T9,A9,3X,G14.6)
              ENDIF
2553      CONTINUE
          WRITE(200,2554) MN
2554      FORMAT(T1,'MT',I4,T9,'LWTR.03T')

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 236 of 647

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      MN=MN+1
    ELSE
      FRUREGIONMLUNIQUE=.FALSE.
      IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
        LEAVE=.FALSE.
        DO 2562 RO=1,(ROW-1)
          DO 2561 CO=1,50
            DO 2560 BN=1,NUMOFBANKS
              IF ((BANKNUM(CO,RO).NE.0)
                .AND.(BANKDES(BANKNUM(CO,RO)).EQ.
                'APSRA')) THEN
                FRUREGIONML(COLUMN,ROW,REGION)=
                FRUREGIONML(CO,RO,REGION)
                LEAVE=.TRUE.
                EXIT
              ENDIF
            CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
        CONTINUE
      2561 IF (LEAVE.EQ..TRUE.) THEN
        EXIT
      ENDIF
    2562 CONTINUE
      IF (LEAVE.EQ..FALSE.) THEN
        DO 2565 RO=ROW,ROW
          DO 2564 CO=1,(COLUMN-1)
            DO 2563 BN=1,NUMOFBANKS
              IF ((BANKNUM(CO,RO).NE.0)
                .AND.(BANKDES(BANKNUM(CO,RO)).EQ.
                'APSRA')) THEN
                FRUREGIONML(COLUMN,ROW,REGION)=
                FRUREGIONML(CO,RO,REGION)
                LEAVE=.TRUE.
                EXIT
              ENDIF
            CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
        CONTINUE
      2564 IF (LEAVE.EQ..TRUE.) THEN
        EXIT
      ENDIF
    2565 CONTINUE
      CONTINUE
    ENDIF
  ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
    LEAVE=.FALSE.
    DO 2568 RO=1,(ROW-1)
      DO 2567 CO=1,50
        DO 2566 BN=1,NUMOFBANKS
          IF ((BANKNUM(CO,RO).NE.0)
            .AND.(BANKDES(BANKNUM(CO,RO)).EQ.

```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 237 of 647

```

c          'APSRA')) THEN
          FRUREGIONML(COLUMN,ROW,REGION)=
c          FRUREGIONML(CO,RO,REGION)
          LEAVE=.TRUE.
          EXIT
          ENDIF
2566      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
          EXIT
          ENDIF
2567      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
          EXIT
          ENDIF
2568      CONTINUE
          ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
          LEAVE=.FALSE.
          DO 2571 RO=1,1
          DO 2570 CO=1,(COLUMN-1)
          DO 2569 BN=1,NUMOFBANKS
          IF ((BANKNUM(CO,RO).NE.0)
c          .AND.(BANKDES(BANKNUM(CO,RO)).EQ.
c          'APSRA')) THEN
c          FRUREGIONML(COLUMN,ROW,REGION)=
          FRUREGIONML(CO,RO,REGION)
          LEAVE=.TRUE.
          EXIT
          ENDIF
2569      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
          EXIT
          ENDIF
2570      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
          EXIT
          ENDIF
2571      CONTINUE
          ENDIF
*      Write the cell specification for the fuel rod universe upper region.
          IF (REGION.EQ.1) THEN
          WRITE(30,2620) LN, FRUREGIONML(COLUMN,ROW,REGION),
c          (-1*REGABOVEAPSRA(REGION,2)),
c          REGIONBOTTOMSURF, FRUNIV(COLUMN,ROW), REGION
2620      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,
c          ' IMP:N=1 U=',I3,' $ Upper-core region ',I2)
          LN=LN+1
          REGIONTOPSURF=REGIONBOTTOMSURF
          ELSE
c          WRITE(30,2625) LN, FRUREGIONML(COLUMN,ROW,REGION),
c          (-1*REGABOVEAPSRA(REGION,2)), (-1*REGIONTOPSURF),
c          REGIONBOTTOMSURF, FRUNIV(COLUMN,ROW), REGION
2625      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c          ' IMP:N=1 U=',I3,' $ Upper-core region ',I2)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 238 of 647

```

                LN=LN+1
                REGIONTOPSURF=REGIONBOTTOMSURF
            ENDIF
2630          CONTINUE
            APSRAFLAG=.TRUE.
        ELSE
            DO 2720 REGION=1,NUMREGABOVE
*           Determine the current upper region's lower surface specification.
                IF (REGION.EQ.1) THEN
                    REGIONTOPSURF=SYSTEMTOP
                    CURRENTSURF=SURFVALUESPEC (SYSTEMTOP) -
c                   REGABOVE (REGION, 1)
                ENDIF
c               CURRENTSURF=SURFVALUESPEC (REGIONTOPSURF) -
                REGABOVE (REGION, 1)
                IF (REGION.EQ.NUMREGABOVE) THEN
                    REGIONBOTTOMSURF=UEFTOPSURF
                ELSE
                    CURRENTSURFLABEL=0
                    DO 2640 V=1, (SN-1)
                        IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
                            IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
                                CURRENTSURFLABEL=V
                                EXIT
                            ENDIF
                        ENDIF
                    ENDIF
2640          CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    REGIONBOTTOMSURF=SN
                    SURFTYPESPEC (SN) = 'PZ'
                    SURFVALUESPEC (SN) =CURRENTSURF
                    SN=SN+1
                ELSE
                    REGIONBOTTOMSURF=CURRENTSURFLABEL
                ENDIF
            ENDIF
*           Determine if the fuel rod upper region material specification has
*           previously been defined.  If it has been previously defined, determine
*           the upper region material specification label.
                IF (PLAINFLAG.EQ..FALSE.) THEN
                    FRUREGIONMLUNIQUE=.TRUE.
                    FRUREGIONML (COLUMN,ROW,REGION)=MN
*           Check Upper Core Region in the Fuel Rod Universe
                    DO 2643 D=1,REGABOVE (REGION,3)
                        IF (D.EQ.1) THEN
c                           WRITE (200,2641) MN,
c                               ABOVEZAIDS (REGION,D) ,
c                               (-1*ABOVEWTS (REGION,D)) , REGION,
c                               ASSYID (COLUMN,ROW)
2641          FORMAT (T1, 'M', I4, T9, A9, 3X, G14.6,
c                   ' $ Upper Core Region ', I2,
c                   ' in Assembly ', A5)
                        ELSE
                            WRITE (200,2642) ABOVEZAIDS (REGION,D) ,

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 240 of 647

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                DO 2657 CO=1,50
                  DO 2656 BN=1,NUMOFBANKS
                    IF ((BANKNUM(CO,RO).EQ.0).AND.
c                     (ASSYID(CO,RO).NE.' ')) THEN
c                       FRUREGIONML(COLUMN,ROW,REGION)=
                        FRUREGIONML(CO,RO,REGION)
                        LEAVE=.TRUE.
                        EXIT
                    ENDIF
2656                CONTINUE
                    IF (LEAVE.EQ..TRUE.) THEN
                        EXIT
                    ENDIF
2657                CONTINUE
                    IF (LEAVE.EQ..TRUE.) THEN
                        EXIT
                    ENDIF
2658                CONTINUE
                    ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
                        LEAVE=.FALSE.
                        DO 2661 RO=1,1
                          DO 2660 CO=1,(COLUMN-1)
                            DO 2659 BN=1,NUMOFBANKS
c                             IF ((BANKNUM(CO,RO).EQ.0).AND.
c                             (ASSYID(CO,RO).NE.' ')) THEN
c                               FRUREGIONML(COLUMN,ROW,REGION)=
                                FRUREGIONML(CO,RO,REGION)
                                LEAVE=.TRUE.
                                EXIT
                            ENDIF
2659                CONTINUE
                            IF (LEAVE.EQ..TRUE.) THEN
                                EXIT
                            ENDIF
2660                CONTINUE
                            IF (LEAVE.EQ..TRUE.) THEN
                                EXIT
                            ENDIF
2661                CONTINUE
                        ENDIF
                    ENDIF
*   Write the cell specification for the fuel rod universe upper region.
                IF (REGION.EQ.1) THEN
c                  WRITE(30,2710) LN, FRUREGIONML(COLUMN,ROW,REGION),
c                  (-1*REGABOVE(REGION,2)),
2710                REGIONBOTTOMSURF, FRUNIV(COLUMN,ROW), REGION
c                  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,
c                  ' IMP:N=1 U=',I3,' $ Upper-core region ',I2)
                    LN=LN+1
                    REGIONTOPSURF=REGIONBOTTOMSURF
                ELSE
c                  WRITE(30,2715) LN, FRUREGIONML(COLUMN,ROW,REGION),
c                  (-1*REGABOVE(REGION,2)), (-1*REGIONTOPSURF),
c                  REGIONBOTTOMSURF, FRUNIV(COLUMN,ROW), REGION

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 241 of 647

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2715          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c             ' IMP:N=1 U=',I3,' $ Upper-core region ',I2)
             LN=LN+1
             REGIONTOPSURF=REGIONBOTTOMSURF
             ENDIF
2720          CONTINUE
             PLAINFLAG=.TRUE.
             ENDIF
             SPACHEIGHT=0.0
*           Loop through the spacer and moderator regions along the axial
*           length of the fuel rod (from top to bottom).
             DO 2722 SPN=1,NUMOFSPACERS(DESNUM(COLUMN,ROW))
             SPACHEIGHT=SPACHEIGHT+SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
2722          CONTINUE
             DO 2843 SPN=1,NUMOFSPACERS(DESNUM(COLUMN,ROW))
*           Define the homogenized spacer region bounding surfaces.
             IF (SPN.EQ.1) THEN
             SPACERTOPSURF=UEFBOTTOMSURF
             CURRENTSURF=SURFVALUESPEC(UEFBOTTOMSURF)-
c             SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
             CURRENTSURFLABEL=0
             DO 2730 V=1,(SN-1)
             IF (SURFTYPESPEC(V).EQ.'PZ') THEN
             IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
             CURRENTSURFLABEL=V
             EXIT
             ENDIF
             ENDIF
2730          CONTINUE
             IF (CURRENTSURFLABEL.EQ.0) THEN
             SPACERBOTTOMSURF=SN
             SURFTYPESPEC(SN)='PZ'
             SURFVALUESPEC(SN)=CURRENTSURF
             SN=SN+1
             ELSE
             SPACERBOTTOMSURF=CURRENTSURFLABEL
             ENDIF
             WATERREGIONTOPSURF=SPACERBOTTOMSURF
             CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),(SPN+1))
             CURRENTSURFLABEL=0
             DO 2740 V=1,(SN-1)
             IF (SURFTYPESPEC(V).EQ.'PZ') THEN
             IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
             CURRENTSURFLABEL=V
             EXIT
             ENDIF
             ENDIF
2740          CONTINUE
             IF (CURRENTSURFLABEL.EQ.0) THEN
             WATERREGIONBOTTOMSURF=SN
             SURFTYPESPEC(SN)='PZ'
             SURFVALUESPEC(SN)=CURRENTSURF
             SN=SN+1
             ELSE

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 242 of 647

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                WATERREGIONBOTTOMSURF=CURRENTSURFLABEL
                ENDIF
                ELSEIF ((SPN.NE.1).AND.(SPN.NE.
c NUMOFSPACERS(DESNUM(COLUMN,ROW)))) THEN
                SPACERTOPSURF=WATERREGIONBOTTOMSURF
                SURFVALUESPEC(WATERREGIONBOTTOMSURF)-
c SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
                CURRENTSURFLABEL=0
                DO 2750 V=1,(SN-1)
                    IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
                ENDIF
2750 CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                SPACERBOTTOMSURF=SN
                SURFTYPESPEC(SN)='PZ'
                SURFVALUESPEC(SN)=CURRENTSURF
                SN=SN+1
                ELSE
                SPACERBOTTOMSURF=CURRENTSURFLABEL
                ENDIF
                WATERREGIONTOPSURF=SPACERBOTTOMSURF
                CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),(SN+1))
                CURRENTSURFLABEL=0
                DO 2760 V=1,(SN-1)
                    IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
                ENDIF
2760 CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                WATERREGIONBOTTOMSURF=SN
                SURFTYPESPEC(SN)='PZ'
                SURFVALUESPEC(SN)=CURRENTSURF
                SN=SN+1
                ELSE
                WATERREGIONBOTTOMSURF=CURRENTSURFLABEL
                ENDIF
                ELSEIF (SPN.EQ.NUMOFSPACERS(DESNUM(COLUMN,ROW))) THEN
                SPACERTOPSURF=WATERREGIONBOTTOMSURF
                CURRENTSURF=SURFVALUESPEC(WATERREGIONBOTTOMSURF)-
c SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
                CURRENTSURFLABEL=0
                DO 2770 V=1,(SN-1)
                    IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
                ENDIF

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 243 of 647

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                ENDIF
2770          CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    SPACERBOTTOMSURF=SN
                    SURFTYPESPEC(SN)='PZ'
                    SURFVALUESPEC(SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    SPACERBOTTOMSURF=CURRENTSURFLABEL
                ENDIF
                WATERREGIONTOPSURF=SPACERBOTTOMSURF
                WATERREGIONBOTTOMSURF=NODEBOTTOMSURF
            ENDIF
            IF (DUNIQUE(COLUMN,ROW).EQ..TRUE.) THEN
                HOMOSPACERML=MN
                MN=MN+1
                HOMOSPACMLNUM(DESNUM(COLUMN,ROW),SPN)=HOMOSPACERML
                IF ((SPACERMAT(DESNUM(COLUMN,ROW)).EQ.1).AND.
C              (SPN.NE.1)) THEN
                    VAL1=(ASSYPITCH**2)*
C              SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
                    VAL2=RODNUM(DESNUM(COLUMN,ROW))*(PI)*
C              (CLADRADIUS(DESNUM(COLUMN,ROW),2)**2)*
C              SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
                    VAL3=16.0*(GTDATA(DESNUM(COLUMN,ROW),2)**2)*
C              (PI)*SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
                    VAL4=(ITDATA(DESNUM(COLUMN,ROW),2)**2)*(PI)*
C              SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
                    TVOL=VAL1-VAL2-VAL3-VAL4
                    SPACVOL=SPACERVOL(DESNUM(COLUMN,ROW),SPN)
                    MODVOL=TVOL-SPACVOL
                    HOMOSPACERDEN(DESNUM(COLUMN,ROW),SPN)=
C              ((SPACVOL*6.56)+(MODVOL*MODDENSITY))/
C              (MODVOL+SPACVOL)
                    SPACMASS=SPACVOL*6.56
                    MODMASS=MODVOL*MODDENSITY
                    SPACFRAC=SPACMASS/(SPACMASS+MODMASS)
                    MODFRAC=MODMASS/(SPACMASS+MODMASS)
                    BWTINH2O=((PPMB*1E-6)/(1.0+(PPMB*1E-6)))*100.0
                    HWTINH2O=((1.008664904*0.999167*2.0)/
C              ((1.008664904*0.999167*2.0)+
C              (1.008664904*15.857510)))*(100.0-BWTINH2O)
                    OWTINH2O=((1.008664904*15.857510)/
C              ((1.008664904*0.999167*2.0)+
C              (1.008664904*15.857510)))*(100.0-BWTINH2O)
                    B10WTINH2O=((1.008664904*9.926922*0.194)/
C              ((1.008664904*9.926922*0.194)+
C              (1.008664904*10.914730*0.806)))*BWTINH2O
                    B11WTINH2O=((1.008664904*10.914730*0.806)/
C              ((1.008664904*9.926922*0.194)+
C              (1.008664904*10.914730*0.806)))*BWTINH2O
                    OWT=(OWTINH2O*MODFRAC)+(0.120*SPACFRAC)
                    HWT=HWTINH2O*MODFRAC
                    B10WT=B10WTINH2O*MODFRAC

```

Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 244 of 647

```
B11WT=B11WTINH2O*MODFRAC
CRWT=0.100*SPACFRAC
FEWT=0.200*SPACFRAC
ZRWT=98.180*SPACFRAC
SNWT=1.400*SPACFRAC
CR50=0.04
CR52=0.84
CR53=0.10
CR54=0.02
FE54=0.055
FE56=0.92
FE57=0.02
FE58=0.005
WRITE(200,2771) HOMOSPACERML, (-1*HWT),
c   SPN, ASSYID(COLUMN,ROW)
2771  FORMAT(T9,'M',I4,T9,' 1001.50c'3X,G14.8,
c   $ Homogenized Zirc-4 Spacer Number ',I2,' in Assembly ',A5)
WRITE(200,2772) -1*OWT
2772  FORMAT(T9,' 8016.50c',3X,G14.8)
WRITE(200,2773) -1*B10WT
2773  FORMAT(T9,' 5010.50c',3X,G14.8)
WRITE(200,2774) -1*B11WT
2774  FORMAT(T9,' 5011.56c',3X,G14.8)
WRITE(200,2775) -1*CRWT*CR50
2775  FORMAT(T9,'24050.60c',3X,G14.8)
WRITE(200,7050) -1*CRWT*CR52
7050  FORMAT(T9,'24052.60c',3X,G14.8)
WRITE(200,7051) -1*CRWT*CR53
7051  FORMAT(T9,'24053.60c',3X,G14.8)
WRITE(200,7052) -1*CRWT*CR54
7052  FORMAT(T9,'24054.60c',3X,G14.8)
WRITE(200,2776) -1*FEWT*FE54
2776  FORMAT(T9,'26054.60c',3X,G14.8)
WRITE(200,7053) -1*FEWT*FE56
7053  FORMAT(T9,'26056.60c',3X,G14.8)
WRITE(200,7054) -1*FEWT*FE57
7054  FORMAT(T9,'26057.60c',3X,G14.8)
WRITE(200,7055) -1*FEWT*FE58
7055  FORMAT(T9,'26058.60c',3X,G14.8)
WRITE(200,2777) -1*ZRWT
2777  FORMAT(T9,'40093.50c',3X,G14.8)
WRITE(200,2778) -1*SNWT
2778  FORMAT(T9,'50000.35c',3X,G14.8)
ELSEIF ((SPACERMAT(DESNUM(COLUMN,ROW)).EQ.2).AND.
c   (SPN.NE.1)) THEN
c   VAL1=(ASSYPITCH**2)*
c   SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
c   VAL2=RODNUM(DESNUM(COLUMN,ROW))*(PI)*
c   (CLADRADIUS(DESNUM(COLUMN,ROW),2)**2)*
c   SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
c   VAL3=16.0*(GTDATA(DESNUM(COLUMN,ROW),2)**2)*
c   (PI)*SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
c   VAL4=(ITDATA(DESNUM(COLUMN,ROW),2)**2)*(PI)*
c   SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 245 of 647

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TVOL=VAL1-VAL2-VAL3-VAL4
SPACVOL=SPACERVOL (DESNUM (COLUMN, ROW) , SPN)
MODVOL=TVOL-SPACVOL
HOMOSPACERDEN (DESNUM (COLUMN, ROW) , SPN) =
c ((SPACVOL*7.90)+(MODVOL*MODDENSITY))/
c (MODVOL+SPACVOL)
SPACMASS=SPACVOL*7.90
MODMASS=MODVOL*MODDENSITY
SPACFRAC=SPACMASS/(SPACMASS+MODMASS)
MODFRAC=MODMASS/(SPACMASS+MODMASS)
BWTINH2O= ((PPMB*1E-6)/(1.0+(PPMB*1E-6)))*100.0
HWTINH2O= ((1.008664904*0.999167*2.0)/
c ((1.008664904*0.999167*2.0)+
c (1.008664904*15.857510)))*(100.0-BWTINH2O)
OWTINH2O= ((1.008664904*15.857510)/
c ((1.008664904*0.999167*2.0)+
c (1.008664904*15.857510)))*(100.0-BWTINH2O)
B10WTINH2O= ((1.008664904*9.926922*0.194)/
c ((1.008664904*9.926922*0.194)+
c (1.008664904*10.914730*0.806)))*BWTINH2O
B11WTINH2O= ((1.008664904*10.914730*0.806)/
c ((1.008664904*9.926922*0.194)+
c (1.008664904*10.914730*0.806)))*BWTINH2O
OWT=OWTINH2O*MODFRAC
HWT=HWTINH2O*MODFRAC
B10WT=B10WTINH2O*MODFRAC
B11WT=B11WTINH2O*MODFRAC
CWT=0.08*SPACFRAC
NWT=0.100*SPACFRAC
SIWT=0.75*SPACFRAC
PWT=0.045*SPACFRAC
SWT=0.030*SPACFRAC
CRWT=19.000*SPACFRAC
CR50=0.04173684
CR52=0.837
CR53=0.09673684
CR54=0.02452632
MNWT=2.000*SPACFRAC
FEWT=68.745*SPACFRAC
FE54=0.05699324
FE56=0.91868499
FE57=0.02141247
FE58=0.00290930
NIWT=9.250*SPACFRAC
NI58=0.67394595
NI60=0.26648649
NI61=0.01178378
NI62=0.03783784
NI64=0.00994594
c WRITE(200,2779) HOMOSPACERML, (-1*HWT),
2779 SPN, ASSYID(COLUMN,ROW)
c ' $ Homogenized SS304 Spacer Number ',I2,' in Assembly ',A5)
WRITE(200,2780) -1*OWT

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Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 246 of 647

```
2780      FORMAT(T9, ' 8016.50c', 3X, G14.8)
          WRITE(200, 2781) -1*B10WT
2781      FORMAT(T9, ' 5010.50c', 3X, G14.8)
          WRITE(200, 2782) -1*B11WT
2782      FORMAT(T9, ' 5011.56c', 3X, G14.8)
          WRITE(200, 2783) -1*CWT
2783      FORMAT(T9, '6000.50c', 3X, G14.8)
          WRITE(200, 2784) -1*NWT
2784      FORMAT(T9, '7014.50c', 3X, G14.8)
          WRITE(200, 2785) -1*SIWT
2785      FORMAT(T9, '14000.50c', 3X, G14.8)
          WRITE(200, 2786) -1*PWT
2786      FORMAT(T9, '15031.50c', 3X, G14.8)
          WRITE(200, 2787) -1*SWT
2787      FORMAT(T9, '16032.50c', 3X, G14.8)
          WRITE(200, 2788) -1*CRWT*CR50
2788      FORMAT(T9, '24050.60c', 3X, G14.8)
          WRITE(200, 7056) -1*CRWT*CR52
7056      FORMAT(T9, '24052.60c', 3X, G14.8)
          WRITE(200, 7057) -1*CRWT*CR53
7057      FORMAT(T9, '24053.60c', 3X, G14.8)
          WRITE(200, 7058) -1*CRWT*CR54
7058      FORMAT(T9, '24054.60c', 3X, G14.8)
          WRITE(200, 2789) -1*MNWT
2789      FORMAT(T9, '25055.50c', 3X, G14.8)
          WRITE(200, 2790) -1*FEWT*FE54
2790      FORMAT(T9, '26054.60c', 3X, G14.8)
          WRITE(200, 7059) -1*FEWT*FE56
7059      FORMAT(T9, '26056.60c', 3X, G14.8)
          WRITE(200, 7060) -1*FEWT*FE57
7060      FORMAT(T9, '26057.60c', 3X, G14.8)
          WRITE(200, 7061) -1*FEWT*FE58
7061      FORMAT(T9, '26058.60c', 3X, G14.8)
          WRITE(200, 2791) -1*NIWT*NI58
2791      FORMAT(T9, '28058.60c', 3X, G14.8)
          WRITE(200, 7062) -1*NIWT*NI60
7062      FORMAT(T9, '28060.60c', 3X, G14.8)
          WRITE(200, 7063) -1*NIWT*NI61
7063      FORMAT(T9, '28061.60c', 3X, G14.8)
          WRITE(200, 7064) -1*NIWT*NI62
7064      FORMAT(T9, '28062.60c', 3X, G14.8)
          WRITE(200, 7065) -1*NIWT*NI64
7065      FORMAT(T9, '28064.60c', 3X, G14.8)
ELSEIF ((SPACERMAT(DESNUM(COLUMN, ROW)) .EQ. 3) .OR.
c      (SPN.EQ.1)) THEN
          VAL1=(ASSYPITCH**2) *
c      SPACERHEIGHT(DESNUM(COLUMN, ROW), SPN)
          VAL2=RODNUM(DESNUM(COLUMN, ROW)) * (PI) *
c      (CLADRADIUS(DESNUM(COLUMN, ROW), 2)**2) *
c      SPACERHEIGHT(DESNUM(COLUMN, ROW), SPN)
          VAL3=16.0*(GTDATA(DESNUM(COLUMN, ROW), 2)**2) *
c      (PI) *SPACERHEIGHT(DESNUM(COLUMN, ROW), SPN)
          VAL4=(ITDATA(DESNUM(COLUMN, ROW), 2)**2) * (PI) *
c      SPACERHEIGHT(DESNUM(COLUMN, ROW), SPN)
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 247 of 647

```

TVOL=VAL1-VAL2-VAL3-VAL4
SPACVOL=SPACERVOL (DESNUM (COLUMN, ROW) , SPN)
MODVOL=TVOL-SPACVOL
HOMOSPACERDEN (DESNUM (COLUMN, ROW) , SPN) =
c ((SPACVOL*8.19) + (MODVOL*MODDENSITY)) /
c (MODVOL+SPACVOL)
SPACMASS=SPACVOL*8.19
MODMASS=MODVOL*MODDENSITY
SPACFRAC=SPACMASS / (SPACMASS+MODMASS)
MODFRAC=MODMASS / (SPACMASS+MODMASS)
BWTINH2O= ((PPMB*1E-6) / (1.0 + (PPMB*1E-6))) *100.0
HWTINH2O= ((1.008664904*0.999167*2.0) /
c ((1.008664904*0.999167*2.0) +
c (1.008664904*15.857510))) * (100.0-BWTINH2O)
OWTINH2O= ((1.008664904*15.857510) /
c ((1.008664904*0.999167*2.0) +
c (1.008664904*15.857510))) * (100.0-BWTINH2O)
B10WTINH2O= ((1.008664904*9.926922*0.194) /
c ((1.008664904*9.926922*0.194) +
c (1.008664904*10.914730*0.806))) *BWTINH2O
B11WTINH2O= ((1.008664904*10.914730*0.806) /
c ((1.008664904*9.926922*0.194) +
c (1.008664904*10.914730*0.806))) *BWTINH2O
B10WTINB= ((1.008664904*9.926922*0.194) /
c ((1.008664904*9.926922*0.194) +
c (1.008664904*10.914730*0.806))) *100.0
B11WTINB= ((1.008664904*10.914730*0.806) /
c ((1.008664904*9.926922*0.194) +
c (1.008664904*10.914730*0.806))) *100.0
OWT=OWTINH2O*MODFRAC
HWT=HWTINH2O*MODFRAC
B10WT=(B10WTINH2O*MODFRAC) +
c (B10WTINB*0.00006*SPACFRAC)
B11WT=(B11WTINH2O*MODFRAC) +
c (B11WTINB*0.00006*SPACFRAC)
CWT=0.080*SPACFRAC
SIWT=0.350*SPACFRAC
PWT=0.015*SPACFRAC
SWT=0.015*SPACFRAC
CRWT=19.000*SPACFRAC
CR50=0.04173684
CR52=0.837
CR53=0.09673684
CR54=0.02452632
MNWT=0.350*SPACFRAC
FEWT=16.809*SPACFRAC
FE54=0.05699324
FE56=0.91868499
FE57=0.02141247
FE58=0.00290930
NIWT=52.500*SPACFRAC
NI58=0.67394595
NI60=0.26648649
NI61=0.01178378

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 248 of 647

```
NI62=0.03783784
NI64=0.00994594
ALWT=0.500*SPACFRAC
TIWT=0.900*SPACFRAC
COWT=1.000*SPACFRAC
CUWT=0.300*SPACFRAC
CU63=0.683
CU65=0.317
NBWT=2.563*SPACFRAC
MOWT=3.050*SPACFRAC
TAWT=2.563*SPACFRAC
WRITE(200,2792) HOMOSPACERML, (-1*HWT),
c   SPN, ASSYID(COLUMN,ROW)
2792   FORMAT(T1,'M',I4,T9,' 1001.50c'3X,G14.8,
c   $ Homogenized Inconel Spacer Number ',I2,' in Assembly ',A5)
WRITE(200,2793) -1*OWT
2793   FORMAT(T9,' 8016.50c',3X,G14.8)
WRITE(200,2794) -1*B10WT
2794   FORMAT(T9,' 5010.50c',3X,G14.8)
WRITE(200,2795) -1*B11WT
2795   FORMAT(T9,' 5011.56c',3X,G14.8)
WRITE(200,2796) -1*CWT
2796   FORMAT(T9,'6000.50c',3X,G14.8)
WRITE(200,2797) -1*SIWT
2797   FORMAT(T9,'14000.50c',3X,G14.8)
WRITE(200,2798) -1*PWT
2798   FORMAT(T9,'15031.50c',3X,G14.8)
WRITE(200,2799) -1*SWT
2799   FORMAT(T9,'16032.50c',3X,G14.8)
WRITE(200,2800) -1*CRWT*CR50
2800   FORMAT(T9,'24050.60c',3X,G14.8)
WRITE(200,7066) -1*CRWT*CR52
7066   FORMAT(T9,'24052.60c',3X,G14.8)
WRITE(200,7067) -1*CRWT*CR53
7067   FORMAT(T9,'24053.60c',3X,G14.8)
WRITE(200,7068) -1*CRWT*CR54
7068   FORMAT(T9,'24054.60c',3X,G14.8)
WRITE(200,2801) -1*MNWT
2801   FORMAT(T9,'25055.50c',3X,G14.8)
WRITE(200,2802) -1*FEWT*FE54
2802   FORMAT(T9,'26054.60c',3X,G14.8)
WRITE(200,7069) -1*FEWT*FE56
7069   FORMAT(T9,'26056.60c',3X,G14.8)
WRITE(200,7070) -1*FEWT*FE57
7070   FORMAT(T9,'26057.60c',3X,G14.8)
WRITE(200,7071) -1*FEWT*FE58
7071   FORMAT(T9,'26058.60c',3X,G14.8)
WRITE(200,2803) -1*NIWT*NI58
2803   FORMAT(T9,'28058.60c',3X,G14.8)
WRITE(200,7072) -1*NIWT*NI60
7072   FORMAT(T9,'28060.60c',3X,G14.8)
WRITE(200,7073) -1*NIWT*NI61
7073   FORMAT(T9,'28061.60c',3X,G14.8)
WRITE(200,7074) -1*NIWT*NI62
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 249 of 647

```

7074      FORMAT(T9, '28062.60c', 3X, G14.8)
          WRITE(200, 7075) -1*NIWT*NI64
7075      FORMAT(T9, '28064.60c', 3X, G14.8)
          WRITE(200, 2804) -1*ALWT
2804      FORMAT(T9, '13027.50c', 3X, G14.8)
          WRITE(200, 2805) -1*TIWT
2805      FORMAT(T9, '22000.50c', 3X, G14.8)
          WRITE(200, 2806) -1*COWT
2806      FORMAT(T9, '27059.50c', 3X, G14.8)
          WRITE(200, 2807) -1*CUWT*CU63
2807      FORMAT(T9, '29063.60c', 3X, G14.8)
          WRITE(200, 7076) -1*CUWT*CU65
7076      FORMAT(T9, '29065.60c', 3X, G14.8)
          WRITE(200, 2808) -1*NBWT
2808      FORMAT(T9, '41093.50c', 3X, G14.8)
          WRITE(200, 2809) -1*MOWT
2809      FORMAT(T9, '42000.50c', 3X, G14.8)
          WRITE(200, 2810) -1*TAWT
2810      FORMAT(T9, '73181.50c', 3X, G14.8)
          ENDIF
          WRITE(200, 2838) HOMOSPACERML
2838      FORMAT(T1, 'MT', I4, T9, 'LWTR.03T')
          ENDIF
*      Write the current homogenized spacer region cell in this fuel rod
universe.
          IF ((SURFVALUESPEC(PLENUMTOPSURF)).LT.
c      SURFVALUESPEC(UEFBOTTOMSURF)).AND.(SPN.EQ.1)) THEN
          WRITE(30, 2839) LN, HOMOSPACMLNUM(DESNUM(COLUMN, ROW), SPN),
c      (-1*HOMOSPACERDEN(DESNUM(COLUMN, ROW), SPN)), CLADORSURF,
c      (-1*SPACERTOPSURF), SPACERBOTTOMSURF, FRUNIV(COLUMN, ROW),
c      SPN
2839      FORMAT(T1, I4, T6, I4, T11, G14.8, T25, I4, 1X, I4, 1X, I4,
c      ' IMP:N=1 U=', I3,
c      ' $ Homogenized region for spacer ', I2)
          LN=LN+1
          WRITE(30, 2840) LN, HOMOSPACMLNUM(DESNUM(COLUMN, ROW), SPN),
c      (-1*HOMOSPACERDEN(DESNUM(COLUMN, ROW), SPN)),
c      (-1*CLADORSURF),
c      (-1*UEFBOTTOMSURF), PLENUMTOPSURF, FRUNIV(COLUMN, ROW),
c      SPN
2840      FORMAT(T1, I4, T6, I4, T11, G14.8, T25, I4, 1X, I4, 1X, I4,
c      ' IMP:N=1 U=', I3,
c      ' $ Homogenized region for spacer ', I2)
          LN=LN+1
          ELSE
          WRITE(30, 2841) LN, HOMOSPACMLNUM(DESNUM(COLUMN, ROW), SPN),
c      (-1*HOMOSPACERDEN(DESNUM(COLUMN, ROW), SPN)), CLADORSURF,
c      (-1*SPACERTOPSURF), SPACERBOTTOMSURF, FRUNIV(COLUMN, ROW),
c      SPN
2841      FORMAT(T1, I4, T6, I4, T11, G14.8, T25, I4, 1X, I4, 1X, I4,
c      ' IMP:N=1 U=', I3,
c      ' $ Homogenized region for spacer ', I2)
          LN=LN+1
          ENDIF

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 250 of 647

* Write the water region cell below the current homogenized spacer cell in this fuel rod universe.

```

      WRITE(30,2842) LN, BMODML, (-1*MODDENSITY), CLADORSURF,
c      (-1*WATERREGIONTOPSURF), WATERREGIONBOTTOMSURF,
c      FRUNIV(COLUMN,ROW)
2842  FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Borated moderator region')
      LN=LN+1
2843  CONTINUE
      ENDIF
2844  CONTINUE
2845  CONTINUE

```

* Write the specifications for the GT universes that are
 * required to fill the assembly layout specifications previously defined.
 DO 3340 ROW=1,50
 DO 3330 COLUMN=1,50

* Write the GT universe specification if the assembly design is unique.
 *

```

      IF (GTWRITE(COLUMN,ROW).EQ..TRUE.) THEN
* Write the BPR specification header.
      WRITE(30,2846)
2846  FORMAT(T1,'C')
      WRITE(30,2847) ASSYID(COLUMN,ROW)
2847  FORMAT(T1,
c      'C GUIDE TUBE UNIVERSE SPECIFICATION FOR ASSEMBLY ',A5)
      WRITE(30,2850)
2850  FORMAT(T1,'C')

```

* Define the upper end-fitting bottom surface.

```

      CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),1)+
c      ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
      CURRENTSURFLABEL=0
      DO 2860 V=1,(SN-1)
          IF (SURFTYPESPEC(V).EQ.'PZ') THEN
          IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
              CURRENTSURFLABEL=V
              EXIT
          ENDIF
      ENDIF

```

```

2860  CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          UEFBOTTOMSURF=SN
          SURFTYPESPEC(SN)='PZ'
          SURFVALUESPEC(SN)=CURRENTSURF
          SN=SN+1
      ELSE
          UEFBOTTOMSURF=CURRENTSURFLABEL
      ENDIF

```

* Define the upper end-fitting top surface.

```

      CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),1)+
c      ENDFITHEIGHT(DESNUM(COLUMN,ROW),1)+
c      ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
      CURRENTSURFLABEL=0
      DO 2870 V=1,(SN-1)
          IF (SURFTYPESPEC(V).EQ.'PZ') THEN

```

```
      IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
      ENDIF
      ENDIF
2870  CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          UEFTOPSURF=SN
          SURFTYPESPEC(SN)='PZ'
          SURFVALUESPEC(SN)=CURRENTSURF
          SN=SN+1
      ELSE
          UEFTOPSURF=CURRENTSURFLABEL
      ENDIF
      IF (GTSPLIT.NE.1) THEN
*   Define the GT top surface.
          CURRENTSURF=GTDATA(DESNUM(COLUMN,ROW),3)
          IF (CURRENTSURF.GT.SURFVALUESPEC(UEFTOPSURF)) THEN
              CURRENTSURF=SURFVALUESPEC(UEFTOPSURF)
          ENDIF
          CURRENTSURFLABEL=0
          DO 2880 V=1,(SN-1)
              IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                  IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                      CURRENTSURFLABEL=V
                      EXIT
                  ENDIF
              ENDIF
2880  CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
              GTTOPSURF=SN
              SURFTYPESPEC(SN)='PZ'
              SURFVALUESPEC(SN)=CURRENTSURF
              SN=SN+1
          ELSE
              GTTOPSURF=CURRENTSURFLABEL
          ENDIF
*   Define the GT bottom surface.
          CURRENTSURF=GTDATA(DESNUM(COLUMN,ROW),4)
          CURRENTSURFLABEL=0
          DO 2890 V=1,(SN-1)
              IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                  IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                      CURRENTSURFLABEL=V
                      EXIT
                  ENDIF
              ENDIF
2890  CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
              GTBOTSURF=SN
              SURFTYPESPEC(SN)='PZ'
              SURFVALUESPEC(SN)=CURRENTSURF
              SN=SN+1
          ELSE
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 252 of 647

```

          GTBOTSURF=CURRENTSURFLABEL
        ENDIF
*   Define the GT outer radius surface.
          CURRENTSURF=GTDATA (DESNUM (COLUMN,ROW) ,2)
          CURRENTSURFLABEL=0
          DO 2900 V=1, (SN-1)
            IF (SURFTYPESPEC (V) .EQ. 'CZ') THEN
          IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
              CURRENTSURFLABEL=V
              EXIT
            ENDIF
          ENDIF
2900      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
            GTORSURF=SN
            SURFTYPESPEC (SN)='CZ'
            SURFVALUESPEC (SN)=CURRENTSURF
            SN=SN+1
          ELSE
            GTORSURF=CURRENTSURFLABEL
          ENDIF
*   Define the GT inner radius surface.
          CURRENTSURF=GTDATA (DESNUM (COLUMN,ROW) ,1)
          CURRENTSURFLABEL=0
          DO 2910 V=1, (SN-1)
            IF (SURFTYPESPEC (V) .EQ. 'CZ') THEN
          IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
              CURRENTSURFLABEL=V
              EXIT
            ENDIF
          ENDIF
2910      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
            GTIRSURF=SN
            SURFTYPESPEC (SN)='CZ'
            SURFVALUESPEC (SN)=CURRENTSURF
            SN=SN+1
          ELSE
            GTIRSURF=CURRENTSURFLABEL
          ENDIF
          ELSEIF (GTSPLIT.EQ.1) THEN
*   Define the guide tube axial sections for this design.
          DO 2920 SECT=1,NUMOFGTAXS (DESNUM (COLUMN,ROW))
*   Define the GT section top surface.
          CURRENTSURF=GTAXDATA (DESNUM (COLUMN,ROW) ,3,SECT)
          IF (CURRENTSURF.GT.SURFVALUESPEC (UEFTOPSURF)) THEN
            CURRENTSURF=SURFVALUESPEC (UEFTOPSURF)
          ENDIF
          CURRENTSURFLABEL=0
          DO 2912 V=1, (SN-1)
            IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
          IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
              CURRENTSURFLABEL=V
              EXIT

```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 253 of 647

```
                ENDIF
                ENDIF
2912            CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    GTSECTTOPSURF (SECT)=SN
                    SURFTYPESPEC (SN)='PZ'
                    SURFVALUESPEC (SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    GTSECTTOPSURF (SECT)=CURRENTSURFLABEL
                ENDIF
*            Define the GT section bottom surface.
                CURRENTSURF=GTAXDATA (DESNUM (COLUMN,ROW) , 4, SECT)
                CURRENTSURFLABEL=0
                DO 2914 V=1, (SN-1)
                    IF (SURFTYPESPEC (V).EQ.'PZ') THEN
                IF (ABS (SURFVALUESPEC (V)-CURRENTSURF) .LT. (0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
                ENDIF
2914            CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    GTSECTBOTSURF (SECT)=SN
                    SURFTYPESPEC (SN)='PZ'
                    SURFVALUESPEC (SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    GTSECTBOTSURF (SECT)=CURRENTSURFLABEL
                ENDIF
*            Define the GT section outer radius surface.
                CURRENTSURF=GTAXDATA (DESNUM (COLUMN,ROW) , 2, SECT)
                CURRENTSURFLABEL=0
                DO 2916 V=1, (SN-1)
                    IF (SURFTYPESPEC (V).EQ.'CZ') THEN
                IF (ABS (SURFVALUESPEC (V)-CURRENTSURF) .LT. (0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
                ENDIF
2916            CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    GTSECTORSURF (SECT)=SN
                    SURFTYPESPEC (SN)='CZ'
                    SURFVALUESPEC (SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    GTSECTORSURF (SECT)=CURRENTSURFLABEL
                ENDIF
*            Define the GT section inner radius surface.
                CURRENTSURF=GTAXDATA (DESNUM (COLUMN,ROW) , 1, SECT)
                CURRENTSURFLABEL=0
                DO 2918 V=1, (SN-1)
                    IF (SURFTYPESPEC (V).EQ.'CZ') THEN
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 254 of 647

```

                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            2918    CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    GTSECTIRSURF(SECT)=SN
                    SURFTYPESPEC(SN)='CZ'
                    SURFVALUESPEC(SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    GTSECTIRSURF(SECT)=CURRENTSURFLABEL
                ENDIF
            2920    CONTINUE
        ENDIF
*   Define the lower end-fitting top surface.
        CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
        CURRENTSURFLABEL=0
        DO 2922 V=1,(SN-1)
            IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
            2922    CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    LEFTOPSURF=SN
                    SURFTYPESPEC(SN)='PZ'
                    SURFVALUESPEC(SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    LEFTOPSURF=CURRENTSURFLABEL
                ENDIF
*   Write the lower end-fitting cell specification for this empty GT
universe.
*   Determine if the lower end-fitting material specification has
*   previously been defined. If it has been previously defined, determine
*   the lower end-fitting material specification label.
        FRLEFMLUNIQUE=.TRUE.
        LEAVE=.FALSE.
        IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
            DO 2931 RO=1,(ROW-1)
                DO 2930 CO=1,50
                    IF (GTWRITE(COLUMN,ROW).EQ.GTWRITE(CO,RO)) THEN
                        FRLEFMLUNIQUE=.FALSE.
                        LEAVE=.TRUE.
                        GTLEFML(COLUMN,ROW)=GTLEFML(CO,RO)
                        EXIT
                    ENDIF
                2930    CONTINUE
                    IF (LEAVE.EQ..TRUE.) THEN
                        EXIT
                    ENDIF
            2931    CONTINUE
        ENDIF

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 255 of 647

```

                ENDIF
2931      CONTINUE
          IF (LEAVE.EQ..FALSE.) THEN
            DO 2933 RO=ROW,ROW
              DO 2932 CO=1,(COLUMN-1)
                IF (GTWRITE(COLUMN,ROW).EQ.
c          GTWRITE(CO,RO)) THEN
                  FRLEFMLUNIQUE=.FALSE.
                  LEAVE=.TRUE.
                  GTLEFML(COLUMN,ROW)=GTLEFML(CO,RO)
                  EXIT
                ENDIF
              ENDIF
            CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
2933      CONTINUE
          ENDIF
        ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
          DO 2935 RO=1,(ROW-1)
            DO 2934 CO=1,50
              IF (GTWRITE(COLUMN,ROW).EQ.
c          GTWRITE(CO,RO)) THEN
                FRLEFMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                GTLEFML(COLUMN,ROW)=GTLEFML(CO,RO)
                EXIT
              ENDIF
            CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
2934      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
2935      CONTINUE
        ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
          DO 2937 RO=1,1
            DO 2936 CO=1,(COLUMN-1)
              IF (GTWRITE(COLUMN,ROW).EQ.
c          GTWRITE(CO,RO)) THEN
                FRLEFMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                GTLEFML(COLUMN,ROW)=GTLEFML(CO,RO)
                EXIT
              ENDIF
            CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
2936      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
2937      CONTINUE
          ENDIF
        IF (FRLEFMLUNIQUE.EQ..TRUE.) THEN
          GTLEFML(COLUMN,ROW)=MN
* Check Guide Tube Lower End-Fitting Regions
          DO 2940 C=1,LEFMAT(DESNUM(COLUMN,ROW),2)
            IF (C.EQ.1) THEN

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 256 of 647

```

                WRITE(200,2938) GTLEFML(COLUMN,ROW),
c                LEFZAIDS(DESNUM(COLUMN,ROW),C),
c                (-1*LEFWTS(DESNUM(COLUMN,ROW),C))
2938            FORMAT(T1,'M',I4,T9,A9,3X,G14.6,
c                '$ Guide Tube Lower End Fitting')
                ELSE
                WRITE(200,2939) LEFZAIDS(DESNUM(COLUMN,ROW),C),
c                (-1*LEFWTS(DESNUM(COLUMN,ROW),C))
2939            FORMAT(T9,A9,3X,G14.6)
                ENDIF
2940            CONTINUE
                WRITE(200,2941) GTLEFML(COLUMN,ROW)
2941            FORMAT(T1,'MT',I4,T9,'LWTR.03T')
                MN=MN+1
            ENDIF
        IF (GTSPLIT.NE.1) THEN
            IF (SURFVALUESPEC(GTBOTSURF).GE.
c            ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)) THEN
                WRITE(30,2970) LN, GTLEFML(COLUMN,ROW),
c                (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*LEFTOPSURF),
c                GTUNIV(COLUMN,ROW)
2970            FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,' IMP:N=1 U=',I4,
c                '$ Guide tube lower end-fitting')
                LN=LN+1
            ELSE
                WRITE(30,2980) LN, GTLEFML(COLUMN,ROW),
c                (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*LEFTOPSURF),
c                GTORSURF, GTUNIV(COLUMN,ROW)
2980            FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c                ' IMP:N=1 U=',I4,' $ Guide tube lower end-fitting')
                LN=LN+1
                WRITE(30,2990) LN, GTLEFML(COLUMN,ROW),
c                (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*GTBOTSURF),
c                (-1*GTORSURF), GTUNIV(COLUMN,ROW)
2990            FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c                ' IMP:N=1 U=',I4,' $ Guide tube lower end-fitting')
                LN=LN+1
            ENDIF
        ELSEIF (GTSPLIT.EQ.1) THEN
            LGTS=GTSECTBOTSURF(1)
            LGTSOR=GTSECTORSURF(1)
            DO 2992 SECT=2,NUMOFGTAXS(DESNUM(COLUMN,ROW))
                IF (SURFVALUESPEC(GTSECTBOTSURF(SECT)).LT.
c                SURFVALUESPEC(LGTS)) THEN
                    LGTS=GTSECTBOTSURF(SECT)
                    LGTSOR=GTSECTORSURF(SECT)
                ENDIF
            2992        CONTINUE
            IF (SURFVALUESPEC(LGTS).GE.
c            ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)) THEN
                WRITE(30,2994) LN, GTLEFML(COLUMN,ROW),
c                (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*LEFTOPSURF),
c                GTUNIV(COLUMN,ROW)
2994            FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,' IMP:N=1 U=',I4,

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00 Attachment I, Page 257 of 647

```

c      ' $ Guide tube lower end-fitting')
      LN=LN+1
    ELSE
      WRITE(30,2996) LN, GTLEFML(COLUMN,ROW),
        (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*LEFTOPSURF),
c      LGTSOR, GTUNIV(COLUMN,ROW)
c      2996 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c      ' IMP:N=1 U=',I4,' $ Guide tube lower end-fitting')
      LN=LN+1
      WRITE(30,2998) LN, GTLEFML(COLUMN,ROW),
c      (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*LGTS),
c      (-1*LGTSOR), GTUNIV(COLUMN,ROW)
c      2998 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c      ' IMP:N=1 U=',I4,' $ Guide tube lower end-fitting')
      LN=LN+1
    ENDIF
  ENDIF
*      Write the upper end-fitting cell specification for this empty GT
universe.
*      Determine if the GT universe upper end-fitting material specification
has
*      previously been defined. If it has been previously defined, determine
*      the upper end-fitting material specification label.
      FRUEFMLUNIQUE=.TRUE.
      LEAVE=.FALSE.
      IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
        DO 3001 RO=1,(ROW-1)
          DO 3000 CO=1,50
            IF (GTWRITE(COLUMN,ROW).EQ.GTWRITE(CO,RO)) THEN
              FRUEFMLUNIQUE=.FALSE.
              LEAVE=.TRUE.
              GTUEFML(COLUMN,ROW)=GTUEFML(CO,RO)
              EXIT
            ENDIF
          CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
        CONTINUE
        IF (LEAVE.EQ..FALSE.) THEN
          DO 3003 RO=1,(ROW-1)
            DO 3002 CO=1,50
              IF (GTWRITE(COLUMN,ROW).EQ.
c      GTWRITE(CO,RO)) THEN
                FRUEFMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                GTUEFML(COLUMN,ROW)=GTUEFML(CO,RO)
                EXIT
              ENDIF
            CONTINUE
            IF (LEAVE.EQ..TRUE.) THEN
              EXIT
            ENDIF
          CONTINUE
        CONTINUE
      CONTINUE

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 258 of 647

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        ENDIF
    ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
        DO 3005 RO=1,(ROW-1)
            DO 3004 CO=1,50
                IF (GTWRITE(COLUMN,ROW).EQ.
                    GTWRITE(CO,RO)) THEN
                    FRUEFMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    GTUEFML(COLUMN,ROW)=GTUEFML(CO,RO)
                    EXIT
                ENDIF
            CONTINUE
        IF (LEAVE.EQ..TRUE.) THEN
            EXIT
        ENDIF
    CONTINUE
    DO 3007 RO=1,1
        DO 3006 CO=1,(COLUMN-1)
            IF (GTWRITE(COLUMN,ROW).EQ.
                GTWRITE(CO,RO)) THEN
                FRUEFMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                GTUEFML(COLUMN,ROW)=GTUEFML(CO,RO)
                EXIT
            ENDIF
        CONTINUE
    IF (LEAVE.EQ..TRUE.) THEN
        EXIT
    ENDIF
    CONTINUE
    ENDIF
    IF (FRUEFMLUNIQUE.EQ..TRUE.) THEN
        GTUEFML(COLUMN,ROW)=MN
*   Check Guide Tube Upper End-Fitting Regions
        DO 3010 C=1,UEFMAT(DESNUM(COLUMN,ROW),2)
            IF (C.EQ.1) THEN
                WRITE(200,3008) GTUEFML(COLUMN,ROW),
                    UEFZAIDS(DESNUM(COLUMN,ROW),C),
                    (-1*UEFWTS(DESNUM(COLUMN,ROW),C))
                FORMAT(T1,'M',I4,T9,A9,3X,G14.6,
                    '$ Guide Tube Upper End Fitting')
            ELSE
                WRITE(200,3009) UEFZAIDS(DESNUM(COLUMN,ROW),C),
                    (-1*UEFWTS(DESNUM(COLUMN,ROW),C))
                FORMAT(T9,A9,3X,G14.6)
            ENDIF
        CONTINUE
    WRITE(200,3011) GTUEFML(COLUMN,ROW)
    FORMAT(T1,'MT',I4,T9,'LWTR.03T')
    MN=MN+1
    ENDIF
    IF (GTSPLIT.NE.1) THEN
        IF ((SURFVALUESPEC(GTTOPSURF).LE.

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 259 of 647

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c      SURFVALUESPEC(UEFBOTTOMSURF)) THEN
        WRITE(30,3012) LN, GTUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c          (-1*UEFTOPSURF), GTUNIV(COLUMN,ROW)
3012  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c          ' IMP:N=1 U=',I4,' $ Guide tube upper end-fitting')
        LN=LN+1
      ELSEIF ((SURFVALUESPEC(GTTOPSURF).GT.
c      SURFVALUESPEC(UEFBOTTOMSURF)).AND.
c      (SURFVALUESPEC(GTTOPSURF).LT.
c      SURFVALUESPEC(UEFTOPSURF))) THEN
        WRITE(30,3013) LN, GTUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c          (-1*UEFTOPSURF), GTORSURF, GTUNIV(COLUMN,ROW)
3013  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I4,' $ Guide tube upper end-fitting')
        LN=LN+1
        WRITE(30,3014) LN, GTUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), GTTOPSURF,
c          (-1*UEFTOPSURF), (-1*GTORSURF),
c          GTUNIV(COLUMN,ROW)
3014  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I4,' $ Guide tube upper end-fitting')
        LN=LN+1
      ELSEIF (SURFVALUESPEC(GTTOPSURF).EQ.
c      SURFVALUESPEC(UEFTOPSURF)) THEN
        WRITE(30,3015) LN, GTUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c          (-1*UEFTOPSURF), GTORSURF, GTUNIV(COLUMN,ROW)
3015  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I4,' $ Guide tube upper end-fitting')
        LN=LN+1
      ENDIF
      ELSEIF (GTSPLIT.EQ.1) THEN
        UGTS=GTSECTTOPSURF(1)
        UGTSOR=GTSECTORSURF(1)
        DO 3016 SECT=2,NUMOFGTAXS(DESNUM(COLUMN,ROW))
          IF (SURFVALUESPEC(GTSECTTOPSURF(SECT)).GT.
c          SURFVALUESPEC(UGTS)) THEN
            UGTS=GTSECTTOPSURF(SECT)
            UGTSOR=GTSECTORSURF(SECT)
          ENDIF
3016  CONTINUE
        IF ((SURFVALUESPEC(UGTS).LE.
c      SURFVALUESPEC(UEFBOTTOMSURF))) THEN
          WRITE(30,3017) LN, GTUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c          (-1*UEFTOPSURF), GTUNIV(COLUMN,ROW)
3017  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c          ' IMP:N=1 U=',I4,' $ Guide tube upper end-fitting')
          LN=LN+1
        ELSEIF ((SURFVALUESPEC(UGTS).GT.
c      SURFVALUESPEC(UEFBOTTOMSURF)).AND.
c      (SURFVALUESPEC(UGTS).LT.

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 260 of 647

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c      SURFVALUESPEC(UEFTOPSURF))) THEN
c      WRITE(30,3018) LN, GTUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c      (-1*UEFTOPSURF), UGTSOR, GTUNIV(COLUMN,ROW)
3018  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,' $ Guide tube upper end-fitting')
      LN=LN+1
      WRITE(30,3019) LN, GTUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UGTS,
c      (-1*UEFTOPSURF), (-1*UGTSOR),
c      GTUNIV(COLUMN,ROW)
3019  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,' $ Guide tube upper end-fitting')
      LN=LN+1
      ELSEIF (SURFVALUESPEC(GTTOPSURF).EQ.
c      SURFVALUESPEC(UEFTOPSURF)) THEN
c      WRITE(30,3020) LN, GTUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c      (-1*UEFTOPSURF), UGTSOR, GTUNIV(COLUMN,ROW)
3020  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,' $ Guide tube upper end-fitting')
      LN=LN+1
      ENDIF
      ENDIF
*      Write the GT material cell in this GT universe.
      IF (GTSPLIT.NE.1) THEN
*      Determine if the GT material specification has
*      previously been defined. If it has been previously defined, determine
*      the material specification label.
      CLADMLUNIQUE=.TRUE.
      LEAVE=.FALSE.
      IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
        DO 3071 RO=1,(ROW-1)
          DO 3070 CO=1,50
            IF ((DESNUM(CO,RO).NE.0).AND.
c            (BANKNUM(CO,RO).EQ.0)) THEN
              IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.
c              GTMAT(DESNUM(CO,RO))) THEN
                CLADMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                GTML(COLUMN,ROW)=GTML(CO,RO)
                EXIT
              ENDIF
            ENDIF
          CONTINUE
        IF (LEAVE.EQ..TRUE.) THEN
          EXIT
        ENDIF
      CONTINUE
3071  CONTINUE
      IF (LEAVE.EQ..FALSE.) THEN
        DO 3073 RO=ROW,ROW
          DO 3072 CO=1,(COLUMN-1)
            IF ((DESNUM(CO,RO).NE.0).AND.
c            (BANKNUM(CO,RO).EQ.0)) THEN

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 261 of 647

```

      IF (GTMAT (DESNUM (COLUMN, ROW)) .EQ.
c      GTMAT (DESNUM (CO, RO))) THEN
          CLADMLUNIQUE = .FALSE.
          LEAVE = .TRUE.
          GTML (COLUMN, ROW) = GTML (CO, RO)
          EXIT
      ENDIF
      ENDIF
3072      CONTINUE
          IF (LEAVE .EQ. .TRUE.) THEN
              EXIT
          ENDIF
3073      CONTINUE
      ENDIF
      ELSEIF ((COLUMN .EQ. 1) .AND. (ROW .NE. 1)) THEN
          DO 3075 RO = 1, (ROW - 1)
              DO 3074 CO = 1, 50
                  IF ((DESNUM (CO, RO) .NE. 0) .AND.
c                  (BANKNUM (CO, RO) .EQ. 0)) THEN
c                  IF (GTMAT (DESNUM (COLUMN, ROW)) .EQ.
c                  GTMAT (DESNUM (CO, RO))) THEN
                      CLADMLUNIQUE = .FALSE.
                      LEAVE = .TRUE.
                      GTML (COLUMN, ROW) = GTML (CO, RO)
                      EXIT
                  ENDIF
              ENDIF
3074      CONTINUE
          IF (LEAVE .EQ. .TRUE.) THEN
              EXIT
          ENDIF
3075      CONTINUE
      ELSEIF ((ROW .EQ. 1) .AND. (COLUMN .NE. 1)) THEN
          DO 3077 RO = 1, 1
              DO 3076 CO = 1, (COLUMN - 1)
                  IF ((DESNUM (CO, RO) .NE. 0) .AND.
c                  (BANKNUM (CO, RO) .EQ. 0)) THEN
c                  IF (GTMAT (DESNUM (COLUMN, ROW)) .EQ.
c                  GTMAT (DESNUM (CO, RO))) THEN
                      CLADMLUNIQUE = .FALSE.
                      LEAVE = .TRUE.
                      GTML (COLUMN, ROW) = GTML (CO, RO)
                      EXIT
                  ENDIF
              ENDIF
3076      CONTINUE
          IF (LEAVE .EQ. .TRUE.) THEN
              EXIT
          ENDIF
3077      CONTINUE
      ENDIF
      IF (CLADMLUNIQUE .EQ. .TRUE.) THEN
          GTML (COLUMN, ROW) = MN

```

* Check Guide Tube Material

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 262 of 647

```
IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.1) THEN
  DO 3080 C=1,2
    IF (C.EQ.1) THEN
      WRITE(200,9300) GTML(COLUMN,ROW)
    ELSEIF (C.EQ.2) THEN
      WRITE(200,9301)
      WRITE(200,7000)
      WRITE(200,7001)
      WRITE(200,7002)
      WRITE(200,9302)
      WRITE(200,7003)
      WRITE(200,7004)
      WRITE(200,7005)
      WRITE(200,9303)
      WRITE(200,9304)
    ENDIF
3080    CONTINUE
  ELSEIF (GTMAT(DESNUM(COLUMN,ROW))
c    .EQ.2) THEN
    DO 3082 C=1,2
      IF (C.EQ.1) THEN
        WRITE(200,9305) GTML(COLUMN,ROW)
      ELSEIF (C.EQ.2) THEN
        WRITE(200,9306)
        WRITE(200,9307)
        WRITE(200,9308)
        WRITE(200,9309)
        WRITE(200,9310)
        WRITE(200,7006)
        WRITE(200,7007)
        WRITE(200,7008)
        WRITE(200,9311)
        WRITE(200,9312)
        WRITE(200,7009)
        WRITE(200,7010)
        WRITE(200,7011)
        WRITE(200,9313)
        WRITE(200,7012)
        WRITE(200,7013)
        WRITE(200,7014)
        WRITE(200,7015)
      ENDIF
3082    CONTINUE
  ELSEIF (GTMAT(DESNUM(COLUMN,ROW))
c    .EQ.3) THEN
    DO 3084 C=1,2
      IF (C.EQ.1) THEN
        WRITE(200,9314) GTML(COLUMN,ROW)
      ELSEIF (C.EQ.2) THEN
        WRITE(200,9315)
        WRITE(200,9316)
        WRITE(200,9317)
        WRITE(200,9318)
        WRITE(200,7016)
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 263 of 647

```

WRITE(200,7017)
WRITE(200,7018)
WRITE(200,9319)
WRITE(200,9320)
WRITE(200,7019)
WRITE(200,7020)
WRITE(200,7021)
WRITE(200,9321)
WRITE(200,7022)
WRITE(200,7023)
WRITE(200,7024)
WRITE(200,7025)
WRITE(200,9322)
WRITE(200,9323)
WRITE(200,9324)
WRITE(200,9325)
WRITE(200,9326)
WRITE(200,9327)
WRITE(200,7026)
WRITE(200,9328)
WRITE(200,9329)
WRITE(200,9330)
ENDIF
3084 CONTINUE
ENDIF
MN=MN+1
ENDIF
IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.1) THEN
CLADRHO=6.56
ELSEIF (GTMAT(DESNUM(COLUMN,ROW)).EQ.2) THEN
CLADRHO=7.90
ELSEIF (GTMAT(DESNUM(COLUMN,ROW)).EQ.3) THEN
CLADRHO=8.19
ENDIF
WRITE(30,3110) LN, GTML(COLUMN,ROW), (-1*CLADRHO),
c GTIRSURF,
c (-1*GTORSURF), (-1*GTTOPSURF), GTBOTSURF,
c GTUNIV(COLUMN,ROW)
3110 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
c ' IMP:N=1 U=',I4,' $ Guide tube')
LN=LN+1
* Write the moderator cells within the GT in this GT universe.
WRITE(30,3112) LN, BMODML, (-1*MODDENSITY),
c (-1*GTIRSURF), (-1*GTTOPSURF), GTBOTSURF,
c GTUNIV(COLUMN,ROW)
3112 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c ' IMP:N=1 U=',I4,
c ' $ Borated moderator inside guide tube')
LN=LN+1
ELSEIF (GTSPLIT.EQ.1) THEN
DO 3118 SECT=1,NUMOFGTAXS(DESNUM(COLUMN,ROW))
* Determine if the GT material specification has
* previously been defined. If it has been previously defined, determine
* the material specification label.

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 264 of 647

```

CLADMLUNIQUE=.TRUE.
LEAVE=.FALSE.
IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
  DO 3031 RO=1,(ROW-1)
    DO 3030 CO=1,50
      IF ((DESNUM(CO,RO).NE.0).AND.
c      (BANKNUM(CO,RO).EQ.0)) THEN
c      IF (GTAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
c      GTMAT(DESNUM(CO,RO))) THEN
        CLADMLUNIQUE=.FALSE.
        LEAVE=.TRUE.
        GTAXML(COLUMN,ROW,SECT)=GTML(CO,RO)
        EXIT
      ELSEIF (GTAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
c      GTAXMAT(DESNUM(CO,RO),SECT)) THEN
        CLADMLUNIQUE=.FALSE.
        LEAVE=.TRUE.
        GTAXML(COLUMN,ROW,SECT)=GTAXML(CO,RO,SECT)
        EXIT
      ENDIF
    ENDIF
  CONTINUE
  IF (LEAVE.EQ..TRUE.) THEN
    EXIT
  ENDIF
3031 CONTINUE
  IF (LEAVE.EQ..FALSE.) THEN
    DO 3033 RO=ROW,ROW
      DO 3032 CO=1,(COLUMN-1)
        IF ((DESNUM(CO,RO).NE.0).AND.
c        (BANKNUM(CO,RO).EQ.0)) THEN
c        IF (GTAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
c        GTMAT(DESNUM(CO,RO))) THEN
          CLADMLUNIQUE=.FALSE.
          LEAVE=.TRUE.
          GTAXML(COLUMN,ROW,SECT)=GTML(CO,RO)
          EXIT
        ELSEIF (GTAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
c        GTAXMAT(DESNUM(CO,RO),SECT)) THEN
          CLADMLUNIQUE=.FALSE.
          LEAVE=.TRUE.
          GTAXML(COLUMN,ROW,SECT)=GTAXML(CO,RO,SECT)
          EXIT
        ENDIF
      ENDIF
    CONTINUE
    IF (LEAVE.EQ..TRUE.) THEN
      EXIT
    ENDIF
3032 CONTINUE
  CONTINUE
3033 CONTINUE
  ENDIF
ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
  DO 3035 RO=1,(ROW-1)
    DO 3034 CO=1,50

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 265 of 647

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      IF ((DESNUM(CO,RO).NE.0).AND.
c      (BANKNUM(CO,RO).EQ.0)) THEN
      IF (GTAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
c      GTMAT(DESNUM(CO,RO))) THEN
          CLADMLUNIQUE=.FALSE.
          LEAVE=.TRUE.
          GTAXML(COLUMN,ROW,SECT)=GTML(CO,RO)
          EXIT
      ELSEIF (GTAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
c      GTAXMAT(DESNUM(CO,RO),SECT)) THEN
          CLADMLUNIQUE=.FALSE.
          LEAVE=.TRUE.
          GTAXML(COLUMN,ROW,SECT)=GTAXML(CO,RO,SECT)
          EXIT
      ENDIF
      ENDIF
3034      CONTINUE
      IF (LEAVE.EQ..TRUE.) THEN
          EXIT
      ENDIF
3035      CONTINUE
      ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
          DO 3037 RO=1,1
              DO 3036 CO=1,(COLUMN-1)
                  IF ((DESNUM(CO,RO).NE.0).AND.
c                  (BANKNUM(CO,RO).EQ.0)) THEN
                  IF (GTAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
c                  GTMAT(DESNUM(CO,RO))) THEN
                      CLADMLUNIQUE=.FALSE.
                      LEAVE=.TRUE.
                      GTAXML(COLUMN,ROW,SECT)=GTML(CO,RO)
                      EXIT
                  ELSEIF (GTAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
c                  GTAXMAT(DESNUM(CO,RO),SECT)) THEN
                      CLADMLUNIQUE=.FALSE.
                      LEAVE=.TRUE.
                      GTAXML(COLUMN,ROW,SECT)=GTAXML(CO,RO,SECT)
                      EXIT
                  ENDIF
              ENDIF
3036      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
              EXIT
          ENDIF
3037      CONTINUE
      ENDIF
      IF (CLADMLUNIQUE.EQ..TRUE.) THEN
          GTAXML(COLUMN,ROW,SECT)=MN
* Check Guide Tube Material
          IF (GTAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.1) THEN
              DO 3038 C=1,2
                  IF (C.EQ.1) THEN
                      WRITE(200,9300) GTAXML(COLUMN,ROW,SECT)
                  ELSEIF (C.EQ.2) THEN

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 266 of 647

```

WRITE(200,9301)
WRITE(200,7000)
WRITE(200,7001)
WRITE(200,7002)
WRITE(200,9302)
WRITE(200,7003)
WRITE(200,7004)
WRITE(200,7005)
WRITE(200,9303)
WRITE(200,9304)
ENDIF
3038 CONTINUE
ELSEIF (GTAXMAT(DESNUM(COLUMN,ROW),SECT)
      .EQ.2) THEN
      c
      DO 3039 C=1,2
      IF (C.EQ.1) THEN
      WRITE(200,9305) GTAXML(COLUMN,ROW,SECT)
      ELSEIF (C.EQ.2) THEN
      WRITE(200,9306)
      WRITE(200,9307)
      WRITE(200,9308)
      WRITE(200,9309)
      WRITE(200,9310)
      WRITE(200,7006)
      WRITE(200,7007)
      WRITE(200,7008)
      WRITE(200,9311)
      WRITE(200,9312)
      WRITE(200,7009)
      WRITE(200,7010)
      WRITE(200,7011)
      WRITE(200,9313)
      WRITE(200,7012)
      WRITE(200,7013)
      WRITE(200,7014)
      WRITE(200,7015)
      ENDIF
3039 CONTINUE
ELSEIF (GTAXMAT(DESNUM(COLUMN,ROW),SECT)
      .EQ.3) THEN
      c
      DO 3040 C=1,2
      IF (C.EQ.1) THEN
      WRITE(200,9314) GTAXML(COLUMN,ROW,SECT)
      ELSEIF (C.EQ.2) THEN
      WRITE(200,9315)
      WRITE(200,9316)
      WRITE(200,9317)
      WRITE(200,9318)
      WRITE(200,7016)
      WRITE(200,7017)
      WRITE(200,7018)
      WRITE(200,9319)
      WRITE(200,9320)
      WRITE(200,7019)
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 267 of 647

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WRITE(200,7020)
WRITE(200,7021)
WRITE(200,9321)
WRITE(200,7022)
WRITE(200,7023)
WRITE(200,7024)
WRITE(200,7025)
WRITE(200,9322)
WRITE(200,9323)
WRITE(200,9324)
WRITE(200,9325)
WRITE(200,9326)
WRITE(200,9327)
WRITE(200,7026)
WRITE(200,9328)
WRITE(200,9329)
WRITE(200,9330)
ENDIF
3040 CONTINUE
ENDIF
MN=MN+1
ENDIF
IF (GTAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.1) THEN
CLADRHO=6.56
ELSEIF (GTAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.2) THEN
CLADRHO=7.90
ELSEIF (GTAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.3) THEN
CLADRHO=8.19
ENDIF
WRITE(30,3114) LN, GTAXML(COLUMN,ROW,SECT), (-1*CLADRHO),
c GTSECTIRSURF(SECT),
c (-1*GTSECTORSURF(SECT)), (-1*GTSECTTOPSURF(SECT)),
c GTSECTBOTSURF(SECT), GTUNIV(COLUMN,ROW)
3114 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
c ' IMP:N=1 U=',I4,' $ Guide tube')
LN=LN+1
* Write the moderator cells within the GT in this GT universe.
WRITE(30,3116) LN, BMODML, (-1*MODDENSITY),
c (-1*GTSECTIRSURF(SECT)), (-1*GTSECTTOPSURF(SECT)),
c GTSECTBOTSURF(SECT), GTUNIV(COLUMN,ROW)
3116 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c ' IMP:N=1 U=',I4,
c ' $ Borated moderator inside guide tube')
LN=LN+1
3118 CONTINUE
ENDIF
* Loop through the regions above the GT (i.e. the appropriate upper core
regions)
* Define the upper region lower surface.
DO 3228 REGION=1,NUMREGABOVE
* Determine the current upper region's lower surface specification.
IF (REGION.EQ.1) THEN
REGIONTOPSURF=SYSTEMTOP
CURRENTSURF=SURFVALUESPEC(SYSTEMTOP)-

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 268 of 647

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c          REGABOVE(REGION,1)
          ENDIF
          CURRENTSURF=SURFVALUESPEC(REGIONTOPSURF)-
c          REGABOVE(REGION,1)
          IF (REGION.EQ.NUMREGABOVE) THEN
            REGIONBOTTOMSURF=UEFTOPSURF
          ELSE
            CURRENTSURFLABEL=0
            DO 3220 V=1, (SN-1)
              IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                  CURRENTSURFLABEL=V
                  EXIT
                ENDIF
              ENDIF
            CONTINUE
            IF (CURRENTSURFLABEL.EQ.0) THEN
              REGIONBOTTOMSURF=SN
              SURFTYPESPEC(SN)='PZ'
              SURFVALUESPEC(SN)=CURRENTSURF
              SN=SN+1
            ELSE
              REGIONBOTTOMSURF=CURRENTSURFLABEL
            ENDIF
          ENDIF
*      Write the cell specification for the GT universe upper region.
          IF (REGION.EQ.1) THEN
            WRITE(30,3224) LN, FRUREGIONML(COLUMN,ROW,REGION),
c          (-1*REGABOVE(REGION,2)),
c          REGIONBOTTOMSURF, GTUNIV(COLUMN,ROW), REGION
3224      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,
c          ' IMP:N=1 U=',I4,' $ Upper-core region ',I2)
            LN=LN+1
            REGIONTOPSURF=REGIONBOTTOMSURF
          ELSE
            WRITE(30,3226) LN, FRUREGIONML(COLUMN,ROW,REGION),
c          (-1*REGABOVE(REGION,2)), (-1*REGIONTOPSURF),
c          REGIONBOTTOMSURF, GTUNIV(COLUMN,ROW), REGION
3226      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c          ' IMP:N=1 U=',I4,' $ Upper-core region ',I2)
            LN=LN+1
            REGIONTOPSURF=REGIONBOTTOMSURF
          ENDIF
3228      CONTINUE
          SPACHEIGHT=0.0
*      Loop through the spacer and moderator regions along the axial
*      length of the GT (from top to bottom).
          DO 3230 SPN=1,NUMOFSPACERS(DESNUM(COLUMN,ROW))
            SPACHEIGHT=SPACHEIGHT+SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
3230      CONTINUE
          DO 3320 SPN=1,NUMOFSPACERS(DESNUM(COLUMN,ROW))
*      Define the homogenized spacer region bounding surfaces.
          IF (SPN.EQ.1) THEN
            SPACERTOPSURF=UEFBOTTOMSURF

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 269 of 647

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      CURRENTSURF=SURFVALUESPEC (UEFBOTTOMSURF) -
c      SPACERHEIGHT (DESNUM (COLUMN, ROW) , SPN)
      CURRENTSURFLABEL=0
      DO 3232 V=1, (SN-1)
        IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
      IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
        ENDIF
      ENDIF
3232      CONTINUE
      IF (CURRENTSURFLABEL .EQ. 0) THEN
        SPACERBOTTOMSURF=SN
        SURFTYPESPEC (SN) = 'PZ'
        SURFVALUESPEC (SN) =CURRENTSURF
        SN=SN+1
      ELSE
        SPACERBOTTOMSURF=CURRENTSURFLABEL
      ENDIF
      WATERREGIONTOPSURF=SPACERBOTTOMSURF
      CURRENTSURF=SPACERDIST (DESNUM (COLUMN, ROW) , (SPN+1))
      CURRENTSURFLABEL=0
      DO 3234 V=1, (SN-1)
        IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
      IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
        ENDIF
      ENDIF
3234      CONTINUE
      IF (CURRENTSURFLABEL .EQ. 0) THEN
        WATERREGIONBOTTOMSURF=SN
        SURFTYPESPEC (SN) = 'PZ'
        SURFVALUESPEC (SN) =CURRENTSURF
        SN=SN+1
      ELSE
        WATERREGIONBOTTOMSURF=CURRENTSURFLABEL
      ENDIF
      ELSEIF ((SPN.NE.1) .AND. (SPN.NE.
c      NUMOFSPACERS (DESNUM (COLUMN, ROW) ))) THEN
        SPACERTOPSURF=WATERREGIONBOTTOMSURF
        CURRENTSURF=SURFVALUESPEC (WATERREGIONBOTTOMSURF) -
c      SPACERHEIGHT (DESNUM (COLUMN, ROW) , SPN)
        CURRENTSURFLABEL=0
        DO 3236 V=1, (SN-1)
          IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
      IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
        ENDIF
      ENDIF
3236      CONTINUE
      IF (CURRENTSURFLABEL .EQ. 0) THEN
        SPACERBOTTOMSURF=SN

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 270 of 647

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SURFTYPESPEC (SN) = 'PZ'
SURFVALUESPEC (SN) = CURRENTSURF
SN=SN+1
ELSE
  SPACERBOTTOMSURF=CURRENTSURFLABEL
ENDIF
WATERREGIONTOPSURF=SPACERBOTTOMSURF
CURRENTSURF=SPACERDIST (DESNUM (COLUMN, ROW) , (SPN+1))
CURRENTSURFLABEL=0
DO 3238 V=1, (SN-1)
  IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
  CURRENTSURFLABEL=V
  EXIT
  ENDIF
ENDIF
CONTINUE
IF (CURRENTSURFLABEL .EQ. 0) THEN
  WATERREGIONBOTTOMSURF=SN
  SURFTYPESPEC (SN) = 'PZ'
  SURFVALUESPEC (SN) =CURRENTSURF
  SN=SN+1
ELSE
  WATERREGIONBOTTOMSURF=CURRENTSURFLABEL
ENDIF
ELSEIF (SPN .EQ. NUMOFSPACERS (DESNUM (COLUMN, ROW))) THEN
  SPACERTOPSURF=WATERREGIONBOTTOMSURF
  CURRENTSURF=SURFVALUESPEC (WATERREGIONBOTTOMSURF) -
  SPACERHEIGHT (DESNUM (COLUMN, ROW) , SPN)
  CURRENTSURFLABEL=0
DO 3240 V=1, (SN-1)
  IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
  CURRENTSURFLABEL=V
  EXIT
  ENDIF
ENDIF
CONTINUE
IF (CURRENTSURFLABEL .EQ. 0) THEN
  SPACERBOTTOMSURF=SN
  SURFTYPESPEC (SN) = 'PZ'
  SURFVALUESPEC (SN) =CURRENTSURF
  SN=SN+1
ELSE
  SPACERBOTTOMSURF=CURRENTSURFLABEL
ENDIF
WATERREGIONTOPSURF=SPACERBOTTOMSURF
WATERREGIONBOTTOMSURF=NODEBOTTOMSURF
ENDIF
* Write the current homogenized spacer region cell in this GT universe.
IF (GTSPLIT.NE.1) THEN
WRITE(30,3242) LN, HOMOSPACMLNUM (DESNUM (COLUMN, ROW) , SPN) ,
(-1*HOMOSPACERDEN (DESNUM (COLUMN, ROW) , SPN)) , GTORSURF ,
(-1*SPACERTOPSURF) , SPACERBOTTOMSURF , GTUNIV (COLUMN, ROW) ,

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 271 of 647

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c      SPN
3242  FORMAT(T1,I4,T6,I4,T11,G14.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,
c      ' $ Homogenized region for spacer ',I2)
      LN=LN+1
*      Write the water region cell below the current homogenized spacer cell
in this GT universe.
      WRITE(30,3244) LN, BMODML, (-1*MODDENSITY), GTORSURF,
c      (-1*WATERREGIONTOPSURF), WATERREGIONBOTTOMSURF,
c      GTUNIV(COLUMN,ROW)
3244  FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,' $ Borated moderator region')
      LN=LN+1
      ELSEIF (GTSPLIT.EQ.1) THEN
      DO 3270 SECT=1,NUMOFGTAXS(DESNUM(COLUMN,ROW))
      IF ((SURFVALUESPEC(GTSECTTOPSURF(SECT)).GT.
c      SURFVALUESPEC(SPACERTOPSURF)).AND.
c      (SURFVALUESPEC(GTSECTBOTSURF(SECT)).LT.
c      SURFVALUESPEC(SPACERBOTTOMSURF))) THEN
      WRITE(30,3246) LN, HOMOSPACMLNUM(DESNUM(COLUMN,ROW),SPN),
c      (-1*HOMOSPACERDEN(DESNUM(COLUMN,ROW),SPN)),
c      GTSECTORSURF(SECT),
c      (-1*SPACERTOPSURF), SPACERBOTTOMSURF, GTUNIV(COLUMN,ROW),
c      SPN
3246  FORMAT(T1,I4,T6,I4,T11,G14.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,
c      ' $ Homogenized region for spacer ',I2)
      LN=LN+1
      ELSEIF ((SURFVALUESPEC(GTSECTTOPSURF(SECT)).EQ.
c      SURFVALUESPEC(SPACERTOPSURF)).AND.
c      (SURFVALUESPEC(GTSECTBOTSURF(SECT)).LT.
c      SURFVALUESPEC(SPACERBOTTOMSURF))) THEN
      WRITE(30,3248) LN, HOMOSPACMLNUM(DESNUM(COLUMN,ROW),SPN),
c      (-1*HOMOSPACERDEN(DESNUM(COLUMN,ROW),SPN)),
c      GTSECTORSURF(SECT),
c      (-1*SPACERTOPSURF), SPACERBOTTOMSURF, GTUNIV(COLUMN,ROW),
c      SPN
3248  FORMAT(T1,I4,T6,I4,T11,G14.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,
c      ' $ Homogenized region for spacer ',I2)
      LN=LN+1
      ELSEIF ((SURFVALUESPEC(GTSECTTOPSURF(SECT)).EQ.
c      SURFVALUESPEC(SPACERTOPSURF)).AND.
c      (SURFVALUESPEC(GTSECTBOTSURF(SECT)).EQ.
c      SURFVALUESPEC(SPACERBOTTOMSURF))) THEN
      WRITE(30,3250) LN, HOMOSPACMLNUM(DESNUM(COLUMN,ROW),SPN),
c      (-1*HOMOSPACERDEN(DESNUM(COLUMN,ROW),SPN)),
c      GTSECTORSURF(SECT),
c      (-1*SPACERTOPSURF), SPACERBOTTOMSURF, GTUNIV(COLUMN,ROW),
c      SPN
3250  FORMAT(T1,I4,T6,I4,T11,G14.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,
c      ' $ Homogenized region for spacer ',I2)
      LN=LN+1

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 272 of 647

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      ELSEIF ((SURFVALUESPEC (GTSECTTOPSURF (SECT)) .GT.
c     SURFVALUESPEC (SPACERTOPSURF)) .AND.
c     (SURFVALUESPEC (GTSECTBOTSURF (SECT)) .EQ.
c     SURFVALUESPEC (SPACERBOTTOMSURF))) THEN
      WRITE (30,3252) LN, HOMOSPACMLNUM (DESNUM (COLUMN,ROW) ,SPN) ,
c     (-1 *HOMOSPACERDEN (DESNUM (COLUMN,ROW) ,SPN)) ,
c     GTSECTORSURF (SECT) ,
c     (-1 *SPACERTOPSURF) , SPACERBOTTOMSURF , GTUNIV (COLUMN,ROW) ,
c     SPN
3252  FORMAT (T1, I4, T6, I4, T11, G14.8, T25, I4, 1X, I4, 1X, I4,
c     ' IMP:N=1 U=', I4,
c     ' $ Homogenized region for spacer ', I2)
      LN=LN+1
      ELSEIF ((SURFVALUESPEC (GTSECTTOPSURF (SECT)) .GT.
c     SURFVALUESPEC (SPACERTOPSURF)) .AND.
c     (SURFVALUESPEC (GTSECTBOTSURF (SECT)) .GT.
c     SURFVALUESPEC (SPACERBOTTOMSURF)) .AND.
c     (SURFVALUESPEC (GTSECTBOTSURF (SECT)) .LT.
c     SURFVALUESPEC (SPACERTOPSURF))) THEN
      WRITE (30,3254) LN, HOMOSPACMLNUM (DESNUM (COLUMN,ROW) ,SPN) ,
c     (-1 *HOMOSPACERDEN (DESNUM (COLUMN,ROW) ,SPN)) ,
c     GTSECTORSURF (SECT) ,
c     (-1 *SPACERTOPSURF) , GTSECTBOTSURF (SECT) ,
c     GTUNIV (COLUMN,ROW) , SPN
3254  FORMAT (T1, I4, T6, I4, T11, G14.8, T25, I4, 1X, I4, 1X, I4,
c     ' IMP:N=1 U=', I4,
c     ' $ Homogenized region for spacer ', I2)
      LN=LN+1
      ELSEIF ((SURFVALUESPEC (GTSECTTOPSURF (SECT)) .LT.
c     SURFVALUESPEC (SPACERTOPSURF)) .AND.
c     (SURFVALUESPEC (GTSECTBOTSURF (SECT)) .LT.
c     SURFVALUESPEC (SPACERBOTTOMSURF)) .AND.
c     (SURFVALUESPEC (GTSECTTOPSURF (SECT)) .GT.
c     SURFVALUESPEC (SPACERBOTTOMSURF))) THEN
      WRITE (30,3256) LN, HOMOSPACMLNUM (DESNUM (COLUMN,ROW) ,SPN) ,
c     (-1 *HOMOSPACERDEN (DESNUM (COLUMN,ROW) ,SPN)) ,
c     GTSECTORSURF (SECT) ,
c     (-1 *GTSECTTOPSURF (SECT)) , SPACERBOTTOMSURF ,
c     GTUNIV (COLUMN,ROW) , SPN
3256  FORMAT (T1, I4, T6, I4, T11, G14.8, T25, I4, 1X, I4, 1X, I4,
c     ' IMP:N=1 U=', I4,
c     ' $ Homogenized region for spacer ', I2)
      LN=LN+1
      ENDIF

```

* Write the water region cell below the current homogenized spacer cell in this GT universe.

```

      IF ((SURFVALUESPEC (GTSECTTOPSURF (SECT)) .GT.
c     SURFVALUESPEC (WATERREGIONTOPSURF)) .AND.
c     (SURFVALUESPEC (GTSECTBOTSURF (SECT)) .LT.
c     SURFVALUESPEC (WATERREGIONBOTTOMSURF))) THEN
      WRITE (30,3258) LN, BMODML, (-1 *MODDENSITY) ,
c     GTSECTORSURF (SECT) ,
c     (-1 *WATERREGIONTOPSURF) , WATERREGIONBOTTOMSURF ,
c     GTUNIV (COLUMN,ROW)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 273 of 647

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3258      FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c        ' IMP:N=1 U=',I4,' $ Borated moderator region')
        LN=LN+1
        ELSEIF ((SURFVALUESPEC(GTSECTTOPSURF(SECT)).EQ.
c        SURFVALUESPEC(WATERREGIONTOPSURF)).AND.
c        (SURFVALUESPEC(GTSECTBOTSURF(SECT)).LT.
c        SURFVALUESPEC(WATERREGIONBOTTOMSURF))) THEN
        WRITE(30,3260) LN, BMODML, (-1*MODDENSITY),
c        GTSECTORSURF(SECT),
c        (-1*WATERREGIONTOPSURF), WATERREGIONBOTTOMSURF,
c        GTUNIV(COLUMN,ROW)
3260      FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c        ' IMP:N=1 U=',I4,' $ Borated moderator region')
        LN=LN+1
        ELSEIF ((SURFVALUESPEC(GTSECTTOPSURF(SECT)).EQ.
c        SURFVALUESPEC(WATERREGIONTOPSURF)).AND.
c        (SURFVALUESPEC(GTSECTBOTSURF(SECT)).EQ.
c        SURFVALUESPEC(WATERREGIONBOTTOMSURF))) THEN
        WRITE(30,3262) LN, BMODML, (-1*MODDENSITY),
c        GTSECTORSURF(SECT),
c        (-1*WATERREGIONTOPSURF), WATERREGIONBOTTOMSURF,
c        GTUNIV(COLUMN,ROW)
3262      FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c        ' IMP:N=1 U=',I4,' $ Borated moderator region')
        LN=LN+1
        ELSEIF ((SURFVALUESPEC(GTSECTTOPSURF(SECT)).GT.
c        SURFVALUESPEC(WATERREGIONTOPSURF)).AND.
c        (SURFVALUESPEC(GTSECTBOTSURF(SECT)).EQ.
c        SURFVALUESPEC(WATERREGIONBOTTOMSURF))) THEN
        WRITE(30,3264) LN, BMODML, (-1*MODDENSITY),
c        GTSECTORSURF(SECT),
c        (-1*WATERREGIONTOPSURF), WATERREGIONBOTTOMSURF,
c        GTUNIV(COLUMN,ROW)
3264      FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c        ' IMP:N=1 U=',I4,' $ Borated moderator region')
        LN=LN+1
        ELSEIF ((SURFVALUESPEC(GTSECTTOPSURF(SECT)).GT.
c        SURFVALUESPEC(WATERREGIONTOPSURF)).AND.
c        (SURFVALUESPEC(GTSECTBOTSURF(SECT)).GT.
c        SURFVALUESPEC(WATERREGIONBOTTOMSURF)).AND.
c        (SURFVALUESPEC(GTSECTBOTSURF(SECT)).LT.
c        SURFVALUESPEC(WATERREGIONTOPSURF))) THEN
        WRITE(30,3266) LN, BMODML, (-1*MODDENSITY),
c        GTSECTORSURF(SECT),
c        (-1*WATERREGIONTOPSURF), .GTSECTBOTSURF(SECT),
c        GTUNIV(COLUMN,ROW)
3266      FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c        ' IMP:N=1 U=',I4,' $ Borated moderator region')
        LN=LN+1
        ELSEIF ((SURFVALUESPEC(GTSECTTOPSURF(SECT)).LT.
c        SURFVALUESPEC(WATERREGIONTOPSURF)).AND.
c        (SURFVALUESPEC(GTSECTBOTSURF(SECT)).LT.
c        SURFVALUESPEC(WATERREGIONBOTTOMSURF)).AND.
c        (SURFVALUESPEC(GTSECTTOPSURF(SECT)).GT.
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 274 of 647

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      c      SURFVALUESPEC(WATERREGIONBOTTOMSURF))) THEN
      WRITE(30,3268) LN, BMODML, (-1*MODDENSITY),
      c      GTSECTORSURF(SECT),
      c      (-1*GTSECTTOPSURF(SECT)), WATERREGIONBOTTOMSURF,
      c      GTUNIV(COLUMN,ROW)
3268      FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
      c      ' IMP:N=1 U=',I4,' $ Borated moderator region')
      LN=LN+1
      ENDIF
3270      CONTINUE
      ENDIF
3320      CONTINUE
      ENDIF
3330      CONTINUE
3340      CONTINUE
*      Write the specifications for the IT universes that are
*      required to fill the assembly layout specifications previously defined.
      DO 3858 ROW=1,50
      DO 3856 COLUMN=1,50
*      Write the IT universe specification if the assembly design is unique.
*
      IF (DUNIQUE(COLUMN,ROW).EQ..TRUE.) THEN
*      Write the IT specification header.
      WRITE(30,3350)
3350      FORMAT(T1,'C')
      WRITE(30,3352) ASSYID(COLUMN,ROW)
3352      FORMAT(T1,
      c      'C INSTRUMENT TUBE UNIVERSE SPECIFICATION FOR ASSEMBLY ',A5)
      WRITE(30,3354)
3354      FORMAT(T1,'C')
*      Define the upper end-fitting bottom surface.
      CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),1)+
      c      ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
      CURRENTSURFLABEL=0
      DO 3356 V=1,(SN-1)
      IF (SURFTYPESPEC(V).EQ.'PZ') THEN
      IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
      CURRENTSURFLABEL=V
      EXIT
      ENDIF
      ENDIF
3356      CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
      UEFBOTTOMSURF=SN
      SURFTYPESPEC(SN)='PZ'
      SURFVALUESPEC(SN)=CURRENTSURF
      SN=SN+1
      ELSE
      UEFBOTTOMSURF=CURRENTSURFLABEL
      ENDIF
*      Define the upper end-fitting top surface.
      CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),1)+
      c      ENDFITHEIGHT(DESNUM(COLUMN,ROW),1)+
      c      ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 275 of 647

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CURRENTSURFLABEL=0
DO 3358 V=1, (SN-1)
  IF (SURFTYPESPEC(V).EQ.'PZ') THEN
  IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
    CURRENTSURFLABEL=V
    EXIT
  ENDIF
  ENDIF
3358 CONTINUE
  IF (CURRENTSURFLABEL.EQ.0) THEN
    UEFTOPSURF=SN
    SURFTYPESPEC(SN)='PZ'
    SURFVALUESPEC(SN)=CURRENTSURF
    SN=SN+1
  ELSE
    UEFTOPSURF=CURRENTSURFLABEL
  ENDIF
  IF (ITSPLIT.NE.1) THEN
*   Define the IT top surface.
    ITTOPSURF=UEFBOTTOMSURF
*   Define the IT bottom surface.
    CURRENTSURF=ITDATA(DESNUM(COLUMN,ROW),4)
    CURRENTSURFLABEL=0
    DO 3360 V=1, (SN-1)
      IF (SURFTYPESPEC(V).EQ.'PZ') THEN
      IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
        CURRENTSURFLABEL=V
        EXIT
      ENDIF
    ENDIF
3360 CONTINUE
    IF (CURRENTSURFLABEL.EQ.0) THEN
      ITBOTSURF=SN
      SURFTYPESPEC(SN)='PZ'
      SURFVALUESPEC(SN)=CURRENTSURF
      SN=SN+1
    ELSE
      ITBOTSURF=CURRENTSURFLABEL
    ENDIF
*   Define the IT outer radius surface.
    CURRENTSURF=ITDATA(DESNUM(COLUMN,ROW),2)
    CURRENTSURFLABEL=0
    DO 3362 V=1, (SN-1)
      IF (SURFTYPESPEC(V).EQ.'CZ') THEN
      IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
        CURRENTSURFLABEL=V
        EXIT
      ENDIF
    ENDIF
3362 CONTINUE
    IF (CURRENTSURFLABEL.EQ.0) THEN
      ITORSURF=SN
      SURFTYPESPEC(SN)='CZ'
      SURFVALUESPEC(SN)=CURRENTSURF

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 276 of 647

```
        SN=SN+1
        ELSE
            ITORSURF=CURRENTSURFLABEL
        ENDIF
*   Define the IT inner radius surface.
        CURRENTSURF=ITDATA (DESNUM (COLUMN, ROW) , 1)
        CURRENTSURFLABEL=0
        DO 3364 V=1, (SN-1)
            IF (SURFTYPESPEC (V) .EQ. 'CZ') THEN
                IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
3364    CONTINUE
        IF (CURRENTSURFLABEL.EQ.0) THEN
            ITIRSURF=SN
            SURFTYPESPEC (SN)='CZ'
            SURFVALUESPEC (SN)=CURRENTSURF
            SN=SN+1
        ELSE
            ITIRSURF=CURRENTSURFLABEL
        ENDIF
        ELSEIF (ITSPLIT.EQ.1) THEN
            DO 3374 SECT=1, NUMOFITAXS (DESNUM (COLUMN, ROW))
*   Define the IT top surface.
                CURRENTSURF=ITAXDATA (DESNUM (COLUMN, ROW) , 3, SECT)
                CURRENTSURFLABEL=0
                DO 3366 V=1, (SN-1)
                    IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
                        IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
                            CURRENTSURFLABEL=V
                            EXIT
                        ENDIF
                    ENDIF
3366    CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    ITSECTTOPSURF (SECT)=SN
                    SURFTYPESPEC (SN)='PZ'
                    SURFVALUESPEC (SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    ITSECTTOPSURF (SECT)=CURRENTSURFLABEL
                ENDIF
*   Define the IT bottom surface.
                CURRENTSURF=ITAXDATA (DESNUM (COLUMN, ROW) , 4, SECT)
                CURRENTSURFLABEL=0
                DO 3368 V=1, (SN-1)
                    IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
                        IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
                            CURRENTSURFLABEL=V
                            EXIT
                        ENDIF
                    ENDIF
                ENDIF
            ENDIF
```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 277 of 647

```
3368      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
            ITSECTBOTSURF(SECT)=SN
            SURFTYPESPEC(SN)='PZ'
            SURFVALUESPEC(SN)=CURRENTSURF
            SN=SN+1
          ELSE
            ITSECTBOTSURF(SECT)=CURRENTSURFLABEL
          ENDIF
* Define the IT outer radius surface.
  CURRENTSURF=ITAXDATA(DESNUM(COLUMN,ROW),2,SECT)
  CURRENTSURFLABEL=0
  DO 3370 V=1,(SN-1)
    IF (SURFTYPESPEC(V).EQ.'CZ') THEN
      IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
        CURRENTSURFLABEL=V
        EXIT
      ENDIF
    ENDIF
3370      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
            ITSECTORSURF(SECT)=SN
            SURFTYPESPEC(SN)='CZ'
            SURFVALUESPEC(SN)=CURRENTSURF
            SN=SN+1
          ELSE
            ITSECTORSURF(SECT)=CURRENTSURFLABEL
          ENDIF
* Define the IT inner radius surface.
  CURRENTSURF=ITAXDATA(DESNUM(COLUMN,ROW),1,SECT)
  CURRENTSURFLABEL=0
  DO 3372 V=1,(SN-1)
    IF (SURFTYPESPEC(V).EQ.'CZ') THEN
      IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
        CURRENTSURFLABEL=V
        EXIT
      ENDIF
    ENDIF
3372      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
            ITSECTIRSURF(SECT)=SN
            SURFTYPESPEC(SN)='CZ'
            SURFVALUESPEC(SN)=CURRENTSURF
            SN=SN+1
          ELSE
            ITSECTIRSURF(SECT)=CURRENTSURFLABEL
          ENDIF
3374      CONTINUE
          ENDIF
* Define the lower end-fitting top surface.
  CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
  CURRENTSURFLABEL=0
  DO 3376 V=1,(SN-1)
    IF (SURFTYPESPEC(V).EQ.'PZ') THEN
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 278 of 647

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                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            3376 CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    LEFTOPSURF=SN
                    SURFTYPESPEC(SN)='PZ'
                    SURFVALUESPEC(SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    LEFTOPSURF=CURRENTSURFLABEL
                ENDIF
*       Write the lower end-fitting cell specification for this empty IT
universe.
*       Determine if the lower end-fitting material specification has
*       previously been defined.  If it has been previously defined, determine
*       the lower end-fitting material specification label.
                FRLEFMLUNIQUE=.TRUE.
                LEAVE=.FALSE.
                IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
                    DO 3380 RO=1,(ROW-1)
                        DO 3378 CO=1,50
                            IF (DESNUM(CO,RO).NE.0) THEN
                                IF (DESNUM(COLUMN,ROW).EQ.DESNUM(CO,RO)) THEN
                                    FRLEFMLUNIQUE=.FALSE.
                                    LEAVE=.TRUE.
                                    ITLEFML(COLUMN,ROW)=ITLEFML(CO,RO)
                                    EXIT
                                ENDIF
                            ENDIF
            3378 CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                    EXIT
                ENDIF
            3380 CONTINUE
                IF (LEAVE.EQ..FALSE.) THEN
                    DO 3384 RO=ROW,ROW
                        DO 3382 CO=1,(COLUMN-1)
                            IF (DESNUM(CO,RO).NE.0) THEN
                                IF (DESNUM(COLUMN,ROW).EQ.
                                DESNUM(CO,RO)) THEN
                                    FRLEFMLUNIQUE=.FALSE.
                                    LEAVE=.TRUE.
                                    ITLEFML(COLUMN,ROW)=ITLEFML(CO,RO)
                                    EXIT
                                ENDIF
                            ENDIF
            3382 CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                    EXIT
                ENDIF
            3384 CONTINUE

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 279 of 647

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      ENDIF
    ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
      DO 3388 RO=1,(ROW-1)
        DO 3386 CO=1,50
          IF (DESNM(CO,RO).NE.0) THEN
            IF (DESNM(COLUMN,ROW).EQ.
              DESNM(CO,RO)) THEN
              FRLEFMLUNIQUE=.FALSE.
              LEAVE=.TRUE.
              ITLEFML(COLUMN,ROW)=ITLEFML(CO,RO)
              EXIT
            ENDIF
          ENDIF
        CONTINUE
      3386 IF (LEAVE.EQ..TRUE.) THEN
        EXIT
      ENDIF
    3388 CONTINUE
  ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
    DO 3392 RO=1,1
      DO 3390 CO=1,(COLUMN-1)
        IF (DESNM(CO,RO).NE.0) THEN
          IF (DESNM(COLUMN,ROW).EQ.
            DESNM(CO,RO)) THEN
            FRLEFMLUNIQUE=.FALSE.
            LEAVE=.TRUE.
            ITLEFML(COLUMN,ROW)=ITLEFML(CO,RO)
            EXIT
          ENDIF
        ENDIF
      3390 CONTINUE
      IF (LEAVE.EQ..TRUE.) THEN
        EXIT
      ENDIF
    3392 CONTINUE
  ENDIF
  IF (FRLEFMLUNIQUE.EQ..TRUE.) THEN
    ITLEFML(COLUMN,ROW)=MN
* Check Instrument Tube Lower End-Fitting Regions
    DO 3398 C=1,LEFMAT(DESNM(COLUMN,ROW),2)
      IF (C.EQ.1) THEN
        WRITE(200,3394) ITLEFML(COLUMN,ROW),
          LEFZAIDS(DESNM(COLUMN,ROW),C),
          (-1*LEFWTS(DESNM(COLUMN,ROW),C))
        3394 FORMAT(T1,'M',I4,T9,A9,3X,G14.6,
          '$ Instrument Tube Lower End Fitting')
      ELSE
        WRITE(200,3396) LEFZAIDS(DESNM(COLUMN,ROW),C),
          (-1*LEFWTS(DESNM(COLUMN,ROW),C))
        3396 FORMAT(T9,A9,3X,G14.6)
      ENDIF
    3398 CONTINUE
    WRITE(200,3400) ITLEFML(COLUMN,ROW)
    3400 FORMAT(T1,'MT',I4,T9,'LWTR.03T')

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 280 of 647

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      MN=MN+1
    ENDIF
  IF (ITSPLIT.NE.1) THEN
    IF (SURFVALUESPEC(ITBOTSURF).GE.
  C   ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)) THEN
      WRITE(30,3402) LN, ITLEFML(COLUMN,ROW),
  C   (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*LEFTOPSURF),
  C   ITUNIV(COLUMN,ROW)
3402  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,' IMP:N=1 U=',I4,
  C   '$ Lower end-fitting region')
      LN=LN+1
    ELSE
      WRITE(30,3404) LN, ITLEFML(COLUMN,ROW),
  C   (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*LEFTOPSURF),
  C   ITORSURF, ITUNIV(COLUMN,ROW)
3404  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
  C   ' IMP:N=1 U=',I4,' $ Lower end-fitting region')
      LN=LN+1
      WRITE(30,3406) LN, ITLEFML(COLUMN,ROW),
  C   (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*ITBOTSURF),
  C   (-1*ITORSURF), ITUNIV(COLUMN,ROW)
3406  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
  C   ' IMP:N=1 U=',I4,' $ Lower end-fitting region')
      LN=LN+1
    ENDIF
  ELSEIF (ITSPLIT.EQ.1) THEN
    LITS=ITSECTBOTSURF(1)
    LITSOR=ITSECTBOTSURF(1)
    DO 3408 SECT=2,NUMOFITAXS(DESNUM(COLUMN,ROW))
      IF (SURFVALUESPEC(ITSECTBOTSURF(SECT)).LT.
  C   SURFVALUESPEC(LITS)) THEN
        LITS=ITSECTBOTSURF(SECT)
        LITSOR=ITSECTORSURF(SECT)
      ENDIF
3408  CONTINUE
      IF (SURFVALUESPEC(LITS).GE.
  C   ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)) THEN
        WRITE(30,3410) LN, ITLEFML(COLUMN,ROW),
  C   (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*LEFTOPSURF),
  C   ITUNIV(COLUMN,ROW)
3410  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,' IMP:N=1 U=',I4,
  C   '$ Instrument tube lower end-fitting')
        LN=LN+1
      ELSE
        WRITE(30,3412) LN, ITLEFML(COLUMN,ROW),
  C   (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*LEFTOPSURF),
  C   LITSOR, ITUNIV(COLUMN,ROW)
3412  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
  C   ' IMP:N=1 U=',I4,
  C   '$ Instrument tube lower end-fitting')
        LN=LN+1
        WRITE(30,3414) LN, ITLEFML(COLUMN,ROW),
  C   (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*LITS),
  C   (-1*LITSOR), ITUNIV(COLUMN,ROW)
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 281 of 647

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3414          FORMAT(T1, I4, T6, I4, T11, F8.5, T25, I4, 1X, I4,
c             ' IMP:N=1 U=', I4,
c             ' $ Instrument tube lower end-fitting')
          LN=LN+1
        ENDIF
      ENDIF
*   Write the upper end-fitting cell specification for this empty IT
universe.
*   Determine if the IT universe upper end-fitting material specification
has
*   previously been defined.  If it has been previously defined, determine
*   the upper end-fitting material specification label.
          FRUEFMLUNIQUE=.TRUE.
          LEAVE=.FALSE.
          IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
            DO 3418 RO=1, (ROW-1)
              DO 3416 CO=1, 50
                IF (DESNUM(CO,RO).NE.0) THEN
                  IF (DESNUM(COLUMN,ROW).EQ.DESNUM(CO,RO)) THEN
                    FRUEFMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    ITUEFML(COLUMN,ROW)=ITUEFML(CO,RO)
                    EXIT
                  ENDIF
                ENDIF
              ENDIF
            CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
3418          CONTINUE
          IF (LEAVE.EQ..FALSE.) THEN
            DO 3422 RO=1, (ROW-1)
              DO 3420 CO=1, 50
                IF (DESNUM(CO,RO).NE.0) THEN
                  IF (DESNUM(COLUMN,ROW).EQ.
c                 DESNUM(CO,RO)) THEN
                    FRUEFMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    ITUEFML(COLUMN,ROW)=ITUEFML(CO,RO)
                    EXIT
                  ENDIF
                ENDIF
              CONTINUE
            CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
3420          CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
3422          CONTINUE
          ENDIF
ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
  DO 3426 RO=1, (ROW-1)
    DO 3424 CO=1, 50
      IF (DESNUM(CO,RO).NE.0) THEN
        IF (DESNUM(COLUMN,ROW).EQ.
c       DESNUM(CO,RO)) THEN

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 282 of 647

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FRUEFMLUNIQUE=.FALSE.
LEAVE=.TRUE.
ITUEFML(COLUMN,ROW)=ITUEFML(CO,RO)
EXIT
ENDIF
3424 CONTINUE
IF (LEAVE.EQ..TRUE.) THEN
EXIT
ENDIF
3426 CONTINUE
ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
DO 3430 RO=1,1
DO 3428 CO=1,(COLUMN-1)
IF (DESNUM(CO,RO).NE.0) THEN
IF (DESNUM(COLUMN,ROW).EQ.
c DESNUM(CO,RO)) THEN
FRUEFMLUNIQUE=.FALSE.
LEAVE=.TRUE.
ITUEFML(COLUMN,ROW)=ITUEFML(CO,RO)
EXIT
ENDIF
ENDIF
3428 CONTINUE
IF (LEAVE.EQ..TRUE.) THEN
EXIT
ENDIF
3430 CONTINUE
ENDIF
IF (FRUEFMLUNIQUE.EQ..TRUE.) THEN
ITUEFML(COLUMN,ROW)=MN
* Check Instrument Tube Upper End-Fitting Regions
DO 3436 C=1,UEFMAT(DESNUM(COLUMN,ROW),2)
IF (C.EQ.1) THEN
c WRITE(200,3432) ITUEFML(COLUMN,ROW),
c UEFZAIDS(DESNUM(COLUMN,ROW),C),
(-1*UEFWTS(DESNUM(COLUMN,ROW),C))
3432 FORMAT(T1,'M',I4,T9,A9,3X,G14.6,
c '$ Instrument Tube Upper End Fitting')
ELSE
c WRITE(200,3434) UEFZAIDS(DESNUM(COLUMN,ROW),C),
(-1*UEFWTS(DESNUM(COLUMN,ROW),C))
3434 FORMAT(T9,A9,3X,G14.6)
ENDIF
3436 CONTINUE
WRITE(200,3438) ITUEFML(COLUMN,ROW)
3438 FORMAT(T1,'MT',I4,T9,'LWTR.03T')
MN=MN+1
ENDIF
IF (ITSPLIT.NE.1) THEN
IF ((SURFVALUESPEC(ITTOPSURF).LE.
c SURFVALUESPEC(UEFBOTTOMSURF))) THEN
WRITE(30,3440) LN, ITUEFML(COLUMN,ROW),
c (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 283 of 647

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c          (-1*UEFTOPSURF), ITUNIV(COLUMN,ROW)
3440      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c          ' IMP:N=1 U=',I4,' $ Upper end-fitting region')
          LN=LN+1
          ELSEIF ((SURFVALUESPEC(ITTOPSURF).GT.
c          SURFVALUESPEC(UEFBOTTOMSURF)).AND.
c          (SURFVALUESPEC(ITTOPSURF).LT.
c          SURFVALUESPEC(UEFTOPSURF))) THEN
          WRITE(30,3442) LN, ITUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c          (-1*UEFTOPSURF), ITORSURF, ITUNIV(COLUMN,ROW)
3442      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I4,' $ Upper end-fitting region')
          LN=LN+1
          WRITE(30,3444) LN, ITUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), ITTOPSURF,
c          (-1*UEFTOPSURF), (-1*ITORSURF),
c          ITUNIV(COLUMN,ROW)
3444      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I4,' $ Upper end-fitting region')
          LN=LN+1
          ELSEIF (SURFVALUESPEC(ITTOPSURF).EQ.
c          SURFVALUESPEC(UEFTOPSURF)) THEN
          WRITE(30,3446) LN, ITUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c          (-1*UEFTOPSURF), ITORSURF, ITUNIV(COLUMN,ROW)
3446      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I4,' $ Upper end-fitting region')
          LN=LN+1
          ENDIF
          ELSEIF (ITSPLIT.EQ.1) THEN
          UITS=ITSECTTOPSURF(1)
          UITSOR=ITSECTORSURF(1)
          DO 3448 SECT=2,NUMOFITAXS(DESNUM(COLUMN,ROW))
          IF (SURFVALUESPEC(ITSECTTOPSURF(SECT)).GT.
c          SURFVALUESPEC(UITS)) THEN
          UITS=ITSECTTOPSURF(SECT)
          UITSOR=ITSECTORSURF(SECT)
          ENDIF
3448      CONTINUE
          IF ((SURFVALUESPEC(UITS).LE.
c          SURFVALUESPEC(UEFBOTTOMSURF))) THEN
          WRITE(30,3450) LN, ITUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c          (-1*UEFTOPSURF), ITUNIV(COLUMN,ROW)
3450      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c          ' IMP:N=1 U=',I4,
c          ' $ Instrument tube upper end-fitting')
          LN=LN+1
          ELSEIF ((SURFVALUESPEC(UITS).GT.
c          SURFVALUESPEC(UEFBOTTOMSURF)).AND.
c          (SURFVALUESPEC(UITS).LT.
c          SURFVALUESPEC(UEFTOPSURF))) THEN
          WRITE(30,3452) LN, ITUEFML(COLUMN,ROW),

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 284 of 647

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c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c      (-1*UEFTOPSURF), UITSOR, ITUNIV(COLUMN,ROW)
3452  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,
c      ' $ Instrument tube upper end-fitting')
      LN=LN+1
      WRITE(30,3454) LN, ITUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UITS,
c      (-1*UEFTOPSURF), (-1*UITSOR),
c      ITUNIV(COLUMN,ROW)
3454  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,
c      ' $ Instrument tube upper end-fitting')
      LN=LN+1
      ELSEIF (SURFVALUESPEC(ITTOPSURF).EQ.
c      SURFVALUESPEC(UEFTOPSURF)) THEN
      WRITE(30,3456) LN, ITUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c      (-1*UEFTOPSURF), UITSOR, ITUNIV(COLUMN,ROW)
3456  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,
c      ' $ Instrument tube upper end-fitting')
      LN=LN+1
      ENDIF
      ENDIF
*      Write the IT material cell in this IT universe.
      IF (ITSPLIT.NE.1) THEN
*      Determine if the IT material specification has
*      previously been defined. If it has been previously defined, determine
*      the material specification label.
      CLADMLUNIQUE=.TRUE.
      LEAVE=.FALSE.
      IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
      DO 3680 RO=1,(ROW-1)
      DO 3670 CO=1,50
      IF (DESNUM(CO,RO).NE.0) THEN
      IF (ITMAT(DESNUM(COLUMN,ROW)).EQ.
c      ITMAT(DESNUM(CO,RO))) THEN
      CLADMLUNIQUE=.FALSE.
      LEAVE=.TRUE.
      ITML(COLUMN,ROW)=ITML(CO,RO)
      EXIT
      ENDIF
      ENDIF
3670  CONTINUE
      IF (LEAVE.EQ..TRUE.) THEN
      EXIT
      ENDIF
3680  CONTINUE
      IF (LEAVE.EQ..FALSE.) THEN
      DO 3700 RO=ROW,ROW
      DO 3690 CO=1,(COLUMN-1)
      IF (DESNUM(CO,RO).NE.0) THEN
      IF (ITMAT(DESNUM(COLUMN,ROW)).EQ.

```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 285 of 647

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c          ITMAT(DESNUM(CO,RO)) THEN
            CLADMLUNIQUE=.FALSE.
            LEAVE=.TRUE.
            ITML(COLUMN,ROW)=ITML(CO,RO)
            EXIT
        ENDIF
    ENDIF
3690      CONTINUE
        IF (LEAVE.EQ..TRUE.) THEN
            EXIT
        ENDIF
3700      CONTINUE
    ENDIF
ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
    DO 3720 RO=1,(ROW-1)
    DO 3710 CO=1,50
        IF (DESNUM(CO,RO).NE.0) THEN
            IF (ITMAT(DESNUM(COLUMN,ROW)).EQ.
c          ITMAT(DESNUM(CO,RO))) THEN
                CLADMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                ITML(COLUMN,ROW)=ITML(CO,RO)
                EXIT
            ENDIF
        ENDIF
3710      CONTINUE
        IF (LEAVE.EQ..TRUE.) THEN
            EXIT
        ENDIF
3720      CONTINUE
    ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
    DO 3740 RO=1,1
    DO 3730 CO=1,(COLUMN-1)
        IF (DESNUM(CO,RO).NE.0) THEN
            IF (ITMAT(DESNUM(COLUMN,ROW)).EQ.
c          ITMAT(DESNUM(CO,RO))) THEN
                CLADMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                ITML(COLUMN,ROW)=ITML(CO,RO)
                EXIT
            ENDIF
        ENDIF
3730      CONTINUE
        IF (LEAVE.EQ..TRUE.) THEN
            EXIT
        ENDIF
3740      CONTINUE
    ENDIF
    IF (CLADMLUNIQUE.EQ..TRUE.) THEN
        ITML(COLUMN,ROW)=MN
* Check Instrument Tube Material
        IF (ITMAT(DESNUM(COLUMN,ROW)).EQ.1) THEN
            DO 3742 C=1,2
                IF (C.EQ.1) THEN

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 286 of 647

```

        WRITE(200,9300) ITML(COLUMN,ROW)
    ELSEIF (C.EQ.2) THEN
        WRITE(200,9301)
        WRITE(200,7000)
        WRITE(200,7001)
        WRITE(200,7002)
        WRITE(200,9302)
        WRITE(200,7003)
        WRITE(200,7004)
        WRITE(200,7005)
        WRITE(200,9303)
        WRITE(200,9304)
    ENDIF
3742    CONTINUE
    ELSEIF (ITMAT(DESNUM(COLUMN,ROW))
c      .EQ.2) THEN
        DO 3744 C=1,2
            IF (C.EQ.1) THEN
                WRITE(200,9305) ITML(COLUMN,ROW)
            ELSEIF (C.EQ.2) THEN
                WRITE(200,9306)
                WRITE(200,9307)
                WRITE(200,9308)
                WRITE(200,9309)
                WRITE(200,9310)
                WRITE(200,7006)
                WRITE(200,7007)
                WRITE(200,7008)
                WRITE(200,9311)
                WRITE(200,9312)
                WRITE(200,7009)
                WRITE(200,7010)
                WRITE(200,7011)
                WRITE(200,9313)
                WRITE(200,7012)
                WRITE(200,7013)
                WRITE(200,7014)
                WRITE(200,7015)
            ENDIF
3744    CONTINUE
    ELSEIF (ITMAT(DESNUM(COLUMN,ROW))
c      .EQ.3) THEN
        DO 3746 C=1,2
            IF (C.EQ.1) THEN
                WRITE(200,9314) ITML(COLUMN,ROW)
            ELSEIF (C.EQ.2) THEN
                WRITE(200,9315)
                WRITE(200,9316)
                WRITE(200,9317)
                WRITE(200,9318)
                WRITE(200,7016)
                WRITE(200,7017)
                WRITE(200,7018)
                WRITE(200,9319)
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 287 of 647

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WRITE(200,9320)
WRITE(200,7019)
WRITE(200,7020)
WRITE(200,7021)
WRITE(200,9321)
WRITE(200,7022)
WRITE(200,7023)
WRITE(200,7024)
WRITE(200,7025)
WRITE(200,9322)
WRITE(200,9323)
WRITE(200,9324)
WRITE(200,9325)
WRITE(200,9326)
WRITE(200,9327)
WRITE(200,7026)
WRITE(200,9328)
WRITE(200,9329)
WRITE(200,9330)
ENDIF
3746 CONTINUE
ENDIF
MN=MN+1
ENDIF
IF (ITMAT(DESNUM(COLUMN,ROW)).EQ.1) THEN
CLADRHO=6.56
ELSEIF (ITMAT(DESNUM(COLUMN,ROW)).EQ.2) THEN
CLADRHO=7.90
ELSEIF (ITMAT(DESNUM(COLUMN,ROW)).EQ.3) THEN
CLADRHO=8.19
ENDIF
WRITE(30,3748) LN, ITML(COLUMN,ROW), (-1*CLADRHO),
c ITIRSURF,
c (-1*ITORSURF), (-1*ITTOPSURF), ITBOTSURF,
c ITUNIV(COLUMN,ROW)
3748 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
c ' IMP:N=1 U=',I4,' $ Instrument tube')
LN=LN+1
* Write the moderator cells within the IT in this IT universe.
WRITE(30,3750) LN, BMODML, (-1*MODDENSITY),
c (-1*ITIRSURF), (-1*ITTOPSURF), ITBOTSURF,
c ITUNIV(COLUMN,ROW)
3750 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c ' IMP:N=1 U=',I4,' $ Borated moderator')
LN=LN+1
ELSEIF (ITSPLIT.EQ.1) THEN
DO 3778 SECT=1,NUMOFGTAXS(DESNUM(COLUMN,ROW))
* Determine if the IT material specification has
* previously been defined. If it has been previously defined, determine
* the material specification label.
CLADMLUNIQUE=.TRUE.
LEAVE=.FALSE.
IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
DO 3754 RO=1,(ROW-1)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 288 of 647

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DO 3752 CO=1,50
  IF ((DESNUM(CO,RO).NE.0).AND.
  (BANKNUM(CO,RO).EQ.0)) THEN
    IF (ITAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
    ITMAT(DESNUM(CO,RO))) THEN
      CLADMLUNIQUE=.FALSE.
      LEAVE=.TRUE.
      ITAXML(COLUMN,ROW,SECT)=ITML(CO,RO)
      EXIT
    ELSEIF (ITAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
    ITAXMAT(DESNUM(CO,RO),SECT)) THEN
      CLADMLUNIQUE=.FALSE.
      LEAVE=.TRUE.
      ITAXML(COLUMN,ROW,SECT)=ITAXML(CO,RO,SECT)
      EXIT
    ENDIF
  ENDIF
3752 CONTINUE
  IF (LEAVE.EQ..TRUE.) THEN
    EXIT
  ENDIF
3754 CONTINUE
  IF (LEAVE.EQ..FALSE.) THEN
    DO 3758 RO=ROW,ROW
      DO 3756 CO=1,(COLUMN-1)
        IF ((DESNUM(CO,RO).NE.0).AND.
        (BANKNUM(CO,RO).EQ.0)) THEN
          IF (ITAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
          ITMAT(DESNUM(CO,RO))) THEN
            CLADMLUNIQUE=.FALSE.
            LEAVE=.TRUE.
            ITAXML(COLUMN,ROW,SECT)=ITML(CO,RO)
            EXIT
          ELSEIF (ITAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
          ITAXMAT(DESNUM(CO,RO),SECT)) THEN
            CLADMLUNIQUE=.FALSE.
            LEAVE=.TRUE.
            ITAXML(COLUMN,ROW,SECT)=ITAXML(CO,RO,SECT)
            EXIT
          ENDIF
        ENDIF
      CONTINUE
    ENDIF
3756 CONTINUE
  IF (LEAVE.EQ..TRUE.) THEN
    EXIT
  ENDIF
3758 CONTINUE
  ENDIF
  ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
    DO 3762 RO=1,(ROW-1)
      DO 3760 CO=1,50
        IF ((DESNUM(CO,RO).NE.0).AND.
        (BANKNUM(CO,RO).EQ.0)) THEN
          IF (ITAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
          ITMAT(DESNUM(CO,RO))) THEN

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 289 of 647

```

                CLADMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                ITAXML(COLUMN,ROW,SECT)=ITML(CO,RO)
                EXIT
c             ELSEIF (ITAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
                ITAXMAT(DESNUM(CO,RO),SECT)) THEN
                CLADMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                ITAXML(COLUMN,ROW,SECT)=ITAXML(CO,RO,SECT)
                EXIT
            ENDIF
        ENDIF
3760        CONTINUE
            IF (LEAVE.EQ..TRUE.) THEN
                EXIT
            ENDIF
3762        CONTINUE
            ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
                DO 3766 RO=1,1
                DO 3764 CO=1,(COLUMN-1)
                IF ((DESNUM(CO,RO).NE.0).AND.
c             (BANKNUM(CO,RO).EQ.0)) THEN
                IF (ITAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
c             ITMAT(DESNUM(CO,RO))) THEN
                CLADMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                ITAXML(COLUMN,ROW,SECT)=ITML(CO,RO)
                EXIT
                ELSEIF (ITAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.
c             ITAXMAT(DESNUM(CO,RO),SECT)) THEN
                CLADMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                ITAXML(COLUMN,ROW,SECT)=ITAXML(CO,RO,SECT)
                EXIT
            ENDIF
        ENDIF
3764        CONTINUE
            IF (LEAVE.EQ..TRUE.) THEN
                EXIT
            ENDIF
3766        CONTINUE
        ENDIF
        IF (CLADMLUNIQUE.EQ..TRUE.) THEN
            ITAXML(COLUMN,ROW,SECT)=MN
*   Check Guide Tube Material
            IF (ITAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.1) THEN
                DO 3768 C=1,2
                IF (C.EQ.1) THEN
                    WRITE(200,9300) ITAXML(COLUMN,ROW,SECT)
                ELSEIF (C.EQ.2) THEN
                    WRITE(200,9301)
                    WRITE(200,7000)
                    WRITE(200,7001)
                    WRITE(200,7002)
                
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 290 of 647

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        WRITE(200,9302)
        WRITE(200,7003)
        WRITE(200,7004)
        WRITE(200,7005)
        WRITE(200,9303)
        WRITE(200,9304)
    ENDIF
3768    CONTINUE
    ELSEIF (ITAXMAT (DESNUM (COLUMN, ROW) , SECT)
c      .EQ.2) THEN
        DO 3770 C=1,2
            IF (C.EQ.1) THEN
                WRITE(200,9305) ITAXML (COLUMN, ROW, SECT)
            ELSEIF (C.EQ.2) THEN
                WRITE(200,9306)
                WRITE(200,9307)
                WRITE(200,9308)
                WRITE(200,9309)
                WRITE(200,9310)
                WRITE(200,7006)
                WRITE(200,7007)
                WRITE(200,7008)
                WRITE(200,9311)
                WRITE(200,9312)
                WRITE(200,7009)
                WRITE(200,7010)
                WRITE(200,7011)
                WRITE(200,9313)
                WRITE(200,7012)
                WRITE(200,7013)
                WRITE(200,7014)
                WRITE(200,7015)
            ENDIF
3770    CONTINUE
    ELSEIF (ITAXMAT (DESNUM (COLUMN, ROW) , SECT)
c      .EQ.3) THEN
        DO 3772 C=1,2
            IF (C.EQ.1) THEN
                WRITE(200,9314) ITAXML (COLUMN, ROW, SECT)
            ELSEIF (C.EQ.2) THEN
                WRITE(200,9315)
                WRITE(200,9316)
                WRITE(200,9317)
                WRITE(200,9318)
                WRITE(200,7016)
                WRITE(200,7017)
                WRITE(200,7018)
                WRITE(200,9319)
                WRITE(200,9320)
                WRITE(200,7019)
                WRITE(200,7020)
                WRITE(200,7021)
                WRITE(200,9321)
                WRITE(200,7022)
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 291 of 647

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WRITE(200,7023)
WRITE(200,7024)
WRITE(200,7025)
WRITE(200,9322)
WRITE(200,9323)
WRITE(200,9324)
WRITE(200,9325)
WRITE(200,9326)
WRITE(200,9327)
WRITE(200,7026)
WRITE(200,9328)
WRITE(200,9329)
WRITE(200,9330)
      ENDIF
3772      CONTINUE
      ENDIF
      MN=MN+1
      ENDIF
      IF (ITAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.1) THEN
        CLADRHO=6.56
      ELSEIF (ITAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.2) THEN
        CLADRHO=7.90
      ELSEIF (ITAXMAT(DESNUM(COLUMN,ROW),SECT).EQ.3) THEN
        CLADRHO=8.19
      ENDIF
      WRITE(30,3774) LN, ITAXML(COLUMN,ROW,SECT), (-1*CLADRHO),
c      ITSECTIRSURF(SECT),
c      (-1*ITSECTORSURF(SECT)), (-1*ITSECTTOPSURF(SECT)),
c      ITSECTBOTSURF(SECT), ITUNIV(COLUMN,ROW)
3774      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,' $ Instrument tube')
      LN=LN+1
*      Write the moderator cells within the IT in this IT universe.
      WRITE(30,3776) LN, BMODML, (-1*MODDENSITY),
c      (-1*ITSECTIRSURF(SECT)), (-1*ITSECTTOPSURF(SECT)),
c      ITSECTBOTSURF(SECT), ITUNIV(COLUMN,ROW)
3776      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,
c      ' $ Borated moderator inside instrument tube')
      LN=LN+1
3778      CONTINUE
      ENDIF
*      Loop through the regions above the IT (i.e. the appropriate upper core
regions)
*      Define the upper region lower surface.
      IF (BANKNUM(COLUMN,ROW).NE.0) THEN
        IF (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'BPRA ') THEN
          DO 3786 REGION=1,NUMREGABOVEBPRA
*      Determine the current upper region's lower surface specification.
          IF (REGION.EQ.1) THEN
            REGIONTOPSURF=SYSTEMTOP
            CURRENTSURF=SURFVALUESPEC(SYSTEMTOP)-
c            REGABOVEBPRA(REGION,1)
          ENDIF

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 292 of 647

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      CURRENTSURF=SURFVALUESPEC (REGIONTOPSURF) -
c      REGABOVEBPRA (REGION, 1)
      IF (REGION.EQ.NUMREGABOVEBPRA) THEN
        REGIONBOTTOMSURF=UEFTOPSURF
      ELSE
        CURRENTSURFLABEL=0
        DO 3780 V=1, (SN-1)
          IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
        ENDIF
      ENDIF
3780      CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
        REGIONBOTTOMSURF=SN
        SURFTYPESPEC (SN) = 'PZ'
        SURFVALUESPEC (SN) =CURRENTSURF
        SN=SN+1
      ELSE
        REGIONBOTTOMSURF=CURRENTSURFLABEL
      ENDIF
      ENDIF
*      Write the cell specification for the IT universe upper region.
      IF (REGION.EQ.1) THEN
        WRITE(30,3782) LN, FRUREGIONML (COLUMN,ROW,REGION),
c        (-1*REGABOVEBPRA (REGION,2)),
c        REGIONBOTTOMSURF, ITUNIV (COLUMN,ROW), REGION
3782      FORMAT (T1,I4,T6,I4,T11,F8.5,T25,I4,
c        ' IMP:N=1 U=',I4,' $ Upper core region ',I2)
        LN=LN+1
        REGIONTOPSURF=REGIONBOTTOMSURF
      ELSE
        WRITE(30,3784) LN, FRUREGIONML (COLUMN,ROW,REGION),
c        (-1*REGABOVEBPRA (REGION,2)), (-1*REGIONTOPSURF),
c        REGIONBOTTOMSURF, ITUNIV (COLUMN,ROW), REGION
3784      FORMAT (T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c        ' IMP:N=1 U=',I4,' $ Upper core region ',I2)
        LN=LN+1
        REGIONTOPSURF=REGIONBOTTOMSURF
      ENDIF
3786      CONTINUE
      ELSEIF (BANKDES (BANKNUM (COLUMN,ROW)) .EQ. 'CRA ') THEN
        DO 3794 REGION=1,NUMREGABOVECRA
*      Determine the current upper region's lower surface specification.
        IF (REGION.EQ.1) THEN
          REGIONTOPSURF=SYSTEMTOP
          CURRENTSURF=SURFVALUESPEC (SYSTEMTOP) -
c          REGABOVECRA (REGION, 1)
          ENDIF
c          CURRENTSURF=SURFVALUESPEC (REGIONTOPSURF) -
          REGABOVECRA (REGION, 1)
          IF (REGION.EQ.NUMREGABOVECRA) THEN
            REGIONBOTTOMSURF=UEFTOPSURF

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 293 of 647

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ELSE
CURRENTSURFLABEL=0
DO 3788 V=1, (SN-1)
  IF (SURFTYPESPEC(V).EQ.'PZ') THEN
IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
  CURRENTSURFLABEL=V
  EXIT
  ENDIF
ENDIF
3788 CONTINUE
IF (CURRENTSURFLABEL.EQ.0) THEN
  REGIONBOTTOMSURF=SN
  SURFTYPESPEC(SN)='PZ'
  SURFVALUESPEC(SN)=CURRENTSURF
  SN=SN+1
ELSE
  REGIONBOTTOMSURF=CURRENTSURFLABEL
ENDIF
ENDIF
* Write the cell specification for the IT universe upper region.
IF (REGION.EQ.1) THEN
  WRITE(30,3790) LN, FRUREGIONML(COLUMN,ROW,REGION),
c      (-1*REGABOVECRA(REGION,2)),
c      REGIONBOTTOMSURF, ITUNIV(COLUMN,ROW), REGION
3790 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,
c      ' IMP:N=1 U=',I4,' $ Upper core region ',I2)
  LN=LN+1
  REGIONTOPSURF=REGIONBOTTOMSURF
ELSE
  WRITE(30,3792) LN, FRUREGIONML(COLUMN,ROW,REGION),
c      (-1*REGABOVECRA(REGION,2)), (-1*REGIONTOPSURF),
c      REGIONBOTTOMSURF, ITUNIV(COLUMN,ROW), REGION
3792 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c      ' IMP:N=1 U=',I4,' $ Upper core region ',I2)
  LN=LN+1
  REGIONTOPSURF=REGIONBOTTOMSURF
ENDIF
3794 CONTINUE
ELSEIF (BANKDES(BANKNUM(COLUMN,ROW)).EQ.'APSRA') THEN
DO 3802 REGION=1,NUMREGABOVEAPSRA
* Determine the current upper region's lower surface specification.
IF (REGION.EQ.1) THEN
  REGIONTOPSURF=SYSTEMTOP
  CURRENTSURF=SURFVALUESPEC(SYSTEMTOP)-
c      REGABOVEAPSRA(REGION,1)
  ENDIF
c      CURRENTSURF=SURFVALUESPEC(REGIONTOPSURF)-
  REGABOVEAPSRA(REGION,1)
  IF (REGION.EQ.NUMREGABOVEAPSRA) THEN
    REGIONBOTTOMSURF=UEFTOPSURF
  ELSE
    CURRENTSURFLABEL=0
    DO 3796 V=1, (SN-1)
      IF (SURFTYPESPEC(V).EQ.'PZ') THEN

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 294 of 647

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                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
3796          CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    REGIONBOTTOMSURF=SN
                    SURFTYPESPEC(SN)='PZ'
                    SURFVALUESPEC(SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    REGIONBOTTOMSURF=CURRENTSURFLABEL
                ENDIF
            ENDIF
*           Write the cell specification for the IT universe upper region.
                IF (REGION.EQ.1) THEN
                    WRITE(30,3798) LN, FRUREGIONML(COLUMN,ROW,REGION),
c              (-1*REGABOVEAPSRA(REGION,2)),
c              REGIONBOTTOMSURF, ITUNIV(COLUMN,ROW), REGION
3798          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,
c              ' IMP:N=1 U=',I4,' $ Upper core region ',I2)
                    LN=LN+1
                    REGIONTOPSURF=REGIONBOTTOMSURF
                ELSE
                    WRITE(30,3800) LN, FRUREGIONML(COLUMN,ROW,REGION),
c              (-1*REGABOVEAPSRA(REGION,2)), (-1*REGIONTOPSURF),
c              REGIONBOTTOMSURF, ITUNIV(COLUMN,ROW), REGION
3800          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c              ' IMP:N=1 U=',I4,' $ Upper core region ',I2)
                    LN=LN+1
                    REGIONTOPSURF=REGIONBOTTOMSURF
                ENDIF
3802          CONTINUE
            ENDIF
            ENDIF
            IF ((BANKNUM(COLUMN,ROW).EQ.0).AND.
c          (ASSYID(COLUMN,ROW).NE.' ')) THEN
                DO 3810 REGION=1,NUMREGABOVE
*           Determine the current upper region's lower surface specification.
                    IF (REGION.EQ.1) THEN
                        REGIONTOPSURF=SYSTEMTOP
                        CURRENTSURF=SURFVALUESPEC(SYSTEMTOP)-
c          REGABOVE(REGION,1)
                    ENDIF
                    CURRENTSURF=SURFVALUESPEC(REGIONTOPSURF)-
c          REGABOVE(REGION,1)
                    IF (REGION.EQ.NUMREGABOVE) THEN
                        REGIONBOTTOMSURF=UEFTOPSURF
                    ELSE
                        CURRENTSURFLABEL=0
                        DO 3804 V=1,(SN-1)
                            IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 295 of 647

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                CURRENTSURFLABEL=V
                EXIT
            ENDIF
        ENDIF
3804      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
            REGIONBOTTOMSURF=SN
            SURFTYPESPEC(SN)='PZ'
            SURFVALUESPEC(SN)=CURRENTSURF
            SN=SN+1
          ELSE
            REGIONBOTTOMSURF=CURRENTSURFLABEL
          ENDIF
        ENDIF
*      Write the cell specification for the IT universe upper region.
          IF (REGION.EQ.1) THEN
            WRITE(30,3806) LN, FRUREGIONML(COLUMN,ROW,REGION),
c          (-1*REGABOVE(REGION,2)),
c          REGIONBOTTOMSURF, ITUNIV(COLUMN,ROW), REGION
3806      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,
c          ' IMP:N=1 U=',I4,' $ Upper core region ',I2)
            LN=LN+1
            REGIONTOPSURF=REGIONBOTTOMSURF
          ELSE
            WRITE(30,3808) LN, FRUREGIONML(COLUMN,ROW,REGION),
c          (-1*REGABOVE(REGION,2)), (-1*REGIONTOPSURF),
c          REGIONBOTTOMSURF, ITUNIV(COLUMN,ROW), REGION
3808      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c          ' IMP:N=1 U=',I4,' $ Upper core region ',I2)
            LN=LN+1
            REGIONTOPSURF=REGIONBOTTOMSURF
          ENDIF
3810      CONTINUE
        ENDIF
        SPACHEIGHT=0.0
*      Loop through the spacer and moderator regions along the axial
*      length of the IT (from top to bottom).
          DO 3812 SPN=1,NUMOFSPACERS(DESNUM(COLUMN,ROW))
            SPACHEIGHT=SPACHEIGHT+SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
3812      CONTINUE
          DO 3854 SPN=1,NUMOFSPACERS(DESNUM(COLUMN,ROW))
*      Define the homogenized spacer region bounding surfaces.
            IF (SPN.EQ.1) THEN
              SPACERTOPSURF=UEFBOTTOMSURF
              CURRENTSURF=SURFVALUESPEC(UEFBOTTOMSURF)-
c            SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
              CURRENTSURFLABEL=0
              DO 3814 V=1,(SN-1)
                IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                  IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                  EXIT
                ENDIF
              ENDIF
            ENDIF
          ENDIF

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 296 of 647

```
3814      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
              SPACERBOTTOMSURF=SN
              SURFTYPESPEC (SN)='PZ'
              SURFVALUESPEC (SN)=CURRENTSURF
              SN=SN+1
          ELSE
              SPACERBOTTOMSURF=CURRENTSURFLABEL
          ENDIF
          WATERREGIONTOPSURF=SPACERBOTTOMSURF
          CURRENTSURF=SPACERDIST (DESNUM (COLUMN, ROW) , (SPN+1))
          CURRENTSURFLABEL=0
          DO 3816 V=1, (SN-1)
              IF (SURFTYPESPEC (V).EQ.'PZ') THEN
IF (ABS (SURFVALUESPEC (V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
3816      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
              WATERREGIONBOTTOMSURF=SN
              SURFTYPESPEC (SN)='PZ'
              SURFVALUESPEC (SN)=CURRENTSURF
              SN=SN+1
          ELSE
              WATERREGIONBOTTOMSURF=CURRENTSURFLABEL
          ENDIF
          ELSEIF ((SPN.NE.1).AND.(SPN.NE.
c          NUMOFSPACERS (DESNUM (COLUMN, ROW)))) THEN
              SPACERTOPSURF=WATERREGIONBOTTOMSURF
              CURRENTSURF=SURFVALUESPEC (WATERREGIONBOTTOMSURF) -
c          SPACERHEIGHT (DESNUM (COLUMN, ROW) , SPN)
              CURRENTSURFLABEL=0
              DO 3818 V=1, (SN-1)
                  IF (SURFTYPESPEC (V).EQ.'PZ') THEN
IF (ABS (SURFVALUESPEC (V)-CURRENTSURF).LT.(0.0001)) THEN
                      CURRENTSURFLABEL=V
                      EXIT
                  ENDIF
              ENDIF
3818      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
              SPACERBOTTOMSURF=SN
              SURFTYPESPEC (SN)='PZ'
              SURFVALUESPEC (SN)=CURRENTSURF
              SN=SN+1
          ELSE
              SPACERBOTTOMSURF=CURRENTSURFLABEL
          ENDIF
          WATERREGIONTOPSURF=SPACERBOTTOMSURF
          CURRENTSURF=SPACERDIST (DESNUM (COLUMN, ROW) , (SPN+1))
          CURRENTSURFLABEL=0
          DO 3820 V=1, (SN-1)
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 297 of 647

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      IF (SURFTYPESPEC(V).EQ.'PZ') THEN
      IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
      ENDIF
      ENDIF
3820  CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          WATERREGIONBOTTOMSURF=SN
          SURFTYPESPEC(SN)='PZ'
          SURFVALUESPEC(SN)=CURRENTSURF
          SN=SN+1
      ELSE
          WATERREGIONBOTTOMSURF=CURRENTSURFLABEL
      ENDIF
      ELSEIF (SPN.EQ.NUMOFSPACERS(DESNUM(COLUMN,ROW))) THEN
          SPACERTOPSURF=WATERREGIONBOTTOMSURF
          CURRENTSURF=SURFVALUESPEC(WATERREGIONBOTTOMSURF)-
          SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
          CURRENTSURFLABEL=0
          DO 3822 V=1,(SN-1)
              IF (SURFTYPESPEC(V).EQ.'PZ') THEN
              IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                  CURRENTSURFLABEL=V
                  EXIT
              ENDIF
          ENDIF
3822  CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          SPACERBOTTOMSURF=SN
          SURFTYPESPEC(SN)='PZ'
          SURFVALUESPEC(SN)=CURRENTSURF
          SN=SN+1
      ELSE
          SPACERBOTTOMSURF=CURRENTSURFLABEL
      ENDIF
      WATERREGIONTOPSURF=SPACERBOTTOMSURF
      WATERREGIONBOTTOMSURF=NODEBOTTOMSURF
      ENDIF
*   Write the current homogenized spacer region cell in this IT universe.
      IF (ITSPLIT.NE.1) THEN
          WRITE(30,3824) LN, HOMOSPACMLNUM(DESNUM(COLUMN,ROW),SPN),
          c   (-1*HOMOSPACERDEN(DESNUM(COLUMN,ROW),SPN)), ITORSURF,
          c   (-1*SPACERTOPSURF), SPACERBOTTOMSURF, ITUNIV(COLUMN,ROW),
          c   SPN
3824  FORMAT(T1,I4,T6,I4,T11,G14.8,T25,I4,1X,I4,1X,I4,
          c   ' IMP:N=1 U=',I4,
          c   ' $ Homogenized region for spacer ',I2)
          LN=LN+1
*   Write the water region cell below the current homogenized spacer cell
in this IT universe.
          WRITE(30,3826) LN, BMODML, (-1*MODDENSITY), ITORSURF,
          c   (-1*WATERREGIONTOPSURF), WATERREGIONBOTTOMSURF,
          c   ITUNIV(COLUMN,ROW)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 298 of 647

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3826      FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c         ' IMP:N=1 U=',I4,' $ Borated moderator')
          LN=LN+1
          ELSEIF (ITSPLIT.EQ.1) THEN
            DO 3852 SECT=1,NUMOFITAXS(DESNUM(COLUMN,ROW))
              IF ((SURFVALUESPEC(ITSECTTOPSURF(SECT)).GT.
c             SURFVALUESPEC(SPACERTOPSURF)).AND.
c             (SURFVALUESPEC(ITSECTBOTSURF(SECT)).LT.
c             SURFVALUESPEC(SPACERBOTTOMSURF))) THEN
                WRITE(30,3828) LN, HOMOSPACMLNUM(DESNUM(COLUMN,ROW),SPN),
c             (-1*HOMOSPACERDEN(DESNUM(COLUMN,ROW),SPN)),
c             ITSECTORSURF(SECT),
c             (-1*SPACERTOPSURF), SPACERBOTTOMSURF, ITUNIV(COLUMN,ROW),
c             SPN
3828      FORMAT(T1,I4,T6,I4,T11,G14.8,T25,I4,1X,I4,1X,I4,
c         ' IMP:N=1 U=',I4,
c         ' $ Homogenized region for spacer ',I2)
          LN=LN+1
          ELSEIF ((SURFVALUESPEC(ITSECTTOPSURF(SECT)).EQ.
c             SURFVALUESPEC(SPACERTOPSURF)).AND.
c             (SURFVALUESPEC(ITSECTBOTSURF(SECT)).LT.
c             SURFVALUESPEC(SPACERBOTTOMSURF))) THEN
                WRITE(30,3830) LN, HOMOSPACMLNUM(DESNUM(COLUMN,ROW),SPN),
c             (-1*HOMOSPACERDEN(DESNUM(COLUMN,ROW),SPN)),
c             ITSECTORSURF(SECT),
c             (-1*SPACERTOPSURF), SPACERBOTTOMSURF, ITUNIV(COLUMN,ROW),
c             SPN
3830      FORMAT(T1,I4,T6,I4,T11,G14.8,T25,I4,1X,I4,1X,I4,
c         ' IMP:N=1 U=',I4,
c         ' $ Homogenized region for spacer ',I2)
          LN=LN+1
          ELSEIF ((SURFVALUESPEC(ITSECTTOPSURF(SECT)).EQ.
c             SURFVALUESPEC(SPACERTOPSURF)).AND.
c             (SURFVALUESPEC(ITSECTBOTSURF(SECT)).EQ.
c             SURFVALUESPEC(SPACERBOTTOMSURF))) THEN
                WRITE(30,3832) LN, HOMOSPACMLNUM(DESNUM(COLUMN,ROW),SPN),
c             (-1*HOMOSPACERDEN(DESNUM(COLUMN,ROW),SPN)),
c             ITSECTORSURF(SECT),
c             (-1*SPACERTOPSURF), SPACERBOTTOMSURF, ITUNIV(COLUMN,ROW),
c             SPN
3832      FORMAT(T1,I4,T6,I4,T11,G14.8,T25,I4,1X,I4,1X,I4,
c         ' IMP:N=1 U=',I4,
c         ' $ Homogenized region for spacer ',I2)
          LN=LN+1
          ELSEIF ((SURFVALUESPEC(ITSECTTOPSURF(SECT)).GT.
c             SURFVALUESPEC(SPACERTOPSURF)).AND.
c             (SURFVALUESPEC(ITSECTBOTSURF(SECT)).EQ.
c             SURFVALUESPEC(SPACERBOTTOMSURF))) THEN
                WRITE(30,3834) LN, HOMOSPACMLNUM(DESNUM(COLUMN,ROW),SPN),
c             (-1*HOMOSPACERDEN(DESNUM(COLUMN,ROW),SPN)),
c             ITSECTORSURF(SECT),
c             (-1*SPACERTOPSURF), SPACERBOTTOMSURF, ITUNIV(COLUMN,ROW),
c             SPN
3834      FORMAT(T1,I4,T6,I4,T11,G14.8,T25,I4,1X,I4,1X,I4,

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 299 of 647

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c      ' IMP:N=1 U=',I4,
c      ' $ Homogenized region for spacer ',I2)
      LN=LN+1
      ELSEIF ((SURFVALUESPEC(ITSECTTOPSURF(SECT)).GT.
c      SURFVALUESPEC(SPACERTOPSURF)).AND.
c      (SURFVALUESPEC(ITSECTBOTSURF(SECT)).GT.
c      SURFVALUESPEC(SPACERBOTTOMSURF)).AND.
c      (SURFVALUESPEC(ITSECTBOTSURF(SECT)).LT.
c      SURFVALUESPEC(SPACERTOPSURF))) THEN
      WRITE(30,3836) LN, HOMOSPACMLNUM(DESDNUM(COLUMN,ROW),SPN),
c      (-1*HOMOSPACERDEN(DESDNUM(COLUMN,ROW),SPN)),
c      ITSECTORSURF(SECT),
c      (-1*SPACERTOPSURF), ITSECTBOTSURF(SECT),
c      ITUNIV(COLUMN,ROW), SPN
3836  FORMAT(T1,I4,T6,I4,T11,G14.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,
c      ' $ Homogenized region for spacer ',I2)
      LN=LN+1
      ELSEIF ((SURFVALUESPEC(ITSECTTOPSURF(SECT)).LT.
c      SURFVALUESPEC(SPACERTOPSURF)).AND.
c      (SURFVALUESPEC(ITSECTBOTSURF(SECT)).LT.
c      SURFVALUESPEC(SPACERBOTTOMSURF)).AND.
c      (SURFVALUESPEC(ITSECTTOPSURF(SECT)).GT.
c      SURFVALUESPEC(SPACERBOTTOMSURF))) THEN
      WRITE(30,3838) LN, HOMOSPACMLNUM(DESDNUM(COLUMN,ROW),SPN),
c      (-1*HOMOSPACERDEN(DESDNUM(COLUMN,ROW),SPN)),
c      ITSECTORSURF(SECT),
c      (-1*ITSECTTOPSURF(SECT)), SPACERBOTTOMSURF,
c      ITUNIV(COLUMN,ROW), SPN
3838  FORMAT(T1,I4,T6,I4,T11,G14.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,
c      ' $ Homogenized region for spacer ',I2)
      LN=LN+1
      ENDIF

```

* Write the water region cell below the current homogenized spacer cell in this GT universe.

```

      IF ((SURFVALUESPEC(ITSECTTOPSURF(SECT)).GT.
c      SURFVALUESPEC(WATERREGIONTOPSURF)).AND.
c      (SURFVALUESPEC(ITSECTBOTSURF(SECT)).LT.
c      SURFVALUESPEC(WATERREGIONBOTTOMSURF))) THEN
      WRITE(30,3840) LN, BMODML, (-1*MODDENSITY),
c      ITSECTORSURF(SECT),
c      (-1*WATERREGIONTOPSURF), WATERREGIONBOTTOMSURF,
c      ITUNIV(COLUMN,ROW)
3840  FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,' $ Borated moderator region')
      LN=LN+1
      ELSEIF ((SURFVALUESPEC(ITSECTTOPSURF(SECT)).EQ.
c      SURFVALUESPEC(WATERREGIONTOPSURF)).AND.
c      (SURFVALUESPEC(ITSECTBOTSURF(SECT)).LT.
c      SURFVALUESPEC(WATERREGIONBOTTOMSURF))) THEN
      WRITE(30,3842) LN, BMODML, (-1*MODDENSITY),
c      ITSECTORSURF(SECT),
c      (-1*WATERREGIONTOPSURF), WATERREGIONBOTTOMSURF,

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 300 of 647

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c      ITUNIV(COLUMN,ROW)
3842  FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,' $ Borated moderator region')
      LN=LN+1
      ELSEIF ((SURFVALUESPEC(ITSECTTOPSURF(SECT)).EQ.
c      SURFVALUESPEC(WATERREGIONTOPSURF)).AND.
c      (SURFVALUESPEC(ITSECTBOTSURF(SECT)).EQ.
c      SURFVALUESPEC(WATERREGIONBOTTOMSURF))) THEN
      WRITE(30,3844) LN, BMODML, (-1*MODDENSITY),
c      ITSECTORSURF(SECT),
c      (-1*WATERREGIONTOPSURF), WATERREGIONBOTTOMSURF,
c      ITUNIV(COLUMN,ROW)
3844  FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,' $ Borated moderator region')
      LN=LN+1
      ELSEIF ((SURFVALUESPEC(ITSECTTOPSURF(SECT)).GT.
c      SURFVALUESPEC(WATERREGIONTOPSURF)).AND.
c      (SURFVALUESPEC(ITSECTBOTSURF(SECT)).EQ.
c      SURFVALUESPEC(WATERREGIONBOTTOMSURF))) THEN
      WRITE(30,3846) LN, BMODML, (-1*MODDENSITY),
c      ITSECTORSURF(SECT),
c      (-1*WATERREGIONTOPSURF), WATERREGIONBOTTOMSURF,
c      ITUNIV(COLUMN,ROW)
3846  FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,' $ Borated moderator region')
      LN=LN+1
      ELSEIF ((SURFVALUESPEC(ITSECTTOPSURF(SECT)).GT.
c      SURFVALUESPEC(WATERREGIONTOPSURF)).AND.
c      (SURFVALUESPEC(ITSECTBOTSURF(SECT)).GT.
c      SURFVALUESPEC(WATERREGIONBOTTOMSURF)).AND.
c      (SURFVALUESPEC(ITSECTBOTSURF(SECT)).LT.
c      SURFVALUESPEC(WATERREGIONTOPSURF))) THEN
      WRITE(30,3848) LN, BMODML, (-1*MODDENSITY),
c      ITSECTORSURF(SECT),
c      (-1*WATERREGIONTOPSURF), ITSECTBOTSURF(SECT),
c      ITUNIV(COLUMN,ROW)
3848  FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,' $ Borated moderator region')
      LN=LN+1
      ELSEIF ((SURFVALUESPEC(ITSECTTOPSURF(SECT)).LT.
c      SURFVALUESPEC(WATERREGIONTOPSURF)).AND.
c      (SURFVALUESPEC(ITSECTBOTSURF(SECT)).LT.
c      SURFVALUESPEC(WATERREGIONBOTTOMSURF)).AND.
c      (SURFVALUESPEC(ITSECTTOPSURF(SECT)).GT.
c      SURFVALUESPEC(WATERREGIONBOTTOMSURF))) THEN
      WRITE(30,3850) LN, BMODML, (-1*MODDENSITY),
c      ITSECTORSURF(SECT),
c      (-1*ITSECTTOPSURF(SECT)), WATERREGIONBOTTOMSURF,
c      ITUNIV(COLUMN,ROW)
3850  FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I4,' $ Borated moderator region')
      LN=LN+1
      ENDIF
3852  CONTINUE
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 301 of 647

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        ENDIF
3854    CONTINUE
        ENDIF
3856    CONTINUE
3858    CONTINUE
*   Write the specifications for the CR universes that are
*   required to fill the assembly layout specifications previously defined.
        IF ((BANDW.EQ..TRUE.).OR.
           c ((WESTINGHOUSE.EQ..TRUE.).AND.
             c ((GTSPLIT.NE.1).AND.(HYBRID.NE.1)))) THEN
            DO 5050 ROW=1,50
                DO 5040 COLUMN=1,50
*   Write the CR universe specification for the assembly if it
*   contains a unique CR material or unique CR position.
*
                IF (CRUNIQUE(COLUMN,ROW).EQ..TRUE.) THEN
*   Write the CR specification header.
                    WRITE(30,4020)
4020    FORMAT(T1,'C')
                    WRITE(30,4030) ASSYID(COLUMN,ROW)
4030    FORMAT(T1,
           c 'C CONTROL ROD UNIVERSE SPECIFICATION FOR ASSEMBLY ',A5)
                    WRITE(30,4040)
4040    FORMAT(T1,'C')
*   Define the upper end-fitting bottom surface.
                    CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),1)+
           c ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
                    CURRENTSURFLABEL=0
                    DO 4042 V=1,(SN-1)
                        IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                            IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                                CURRENTSURFLABEL=V
                                EXIT
                            ENDIF
                        ENDIF
4042    CONTINUE
                    IF (CURRENTSURFLABEL.EQ.0) THEN
                        UEFBOTTOMSURF=SN
                        SURFTYPESPEC(SN)='PZ'
                        SURFVALUESPEC(SN)=CURRENTSURF
                        SN=SN+1
                    ELSE
                        UEFBOTTOMSURF=CURRENTSURFLABEL
                    ENDIF
*   Define the upper end-fitting top surface.
                    CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),1)+
           c ENDFITHEIGHT(DESNUM(COLUMN,ROW),1)+
           c ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
                    CURRENTSURFLABEL=0
                    DO 4044 V=1,(SN-1)
                        IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                            IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                                CURRENTSURFLABEL=V
                                EXIT

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 302 of 647

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                ENDIF
            ENDIF
4044      CONTINUE
            IF (CURRENTSURFLABEL.EQ.0) THEN
                UEFTOPSURF=SN
                SURFTYPESPEC(SN)='PZ'
                SURFVALUESPEC(SN)=CURRENTSURF
                SN=SN+1
            ELSE
                UEFTOPSURF=CURRENTSURFLABEL
            ENDIF
            CRABSML=MN
*      Define the CR absorber radius.
            CURRENTSURF=CRADIM(BANKNUM(COLUMN,ROW),1)
            CURRENTSURFLABEL=0
            DO 4046 V=1,(SN-1)
                IF (SURFTYPESPEC(V).EQ.'CZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
4046      CONTINUE
            IF (CURRENTSURFLABEL.EQ.0) THEN
                CRABSSURF=SN
                SURFTYPESPEC(SN)='CZ'
                SURFVALUESPEC(SN)=CURRENTSURF
                SN=SN+1
            ELSE
                CRABSSURF=CURRENTSURFLABEL
            ENDIF
*      Define the CR absorber top surface.
            CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)+
c          CRADIM(BANKNUM(COLUMN,ROW),4)+
c          CRADIM(BANKNUM(COLUMN,ROW),5)
            IF (CURRENTSURF.GE.SURFVALUESPEC(UEFTOPSURF)) THEN
                CURRENTSURF=SURFVALUESPEC(UEFTOPSURF)
            ENDIF
            CURRENTSURFLABEL=0
            DO 4048 V=1,(SN-1)
                IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
4048      CONTINUE
            IF (CURRENTSURFLABEL.EQ.0) THEN
                CRABSTOPSURF=SN
                SURFTYPESPEC(SN)='PZ'
                SURFVALUESPEC(SN)=CURRENTSURF
                SN=SN+1
            ELSE
                CRABSTOPSURF=CURRENTSURFLABEL

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 303 of 647

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      ENDIF
*   Define the CR absorber bottom surface.
      CURRENTSURF=ENDFITHEIGHT (DESNUM (COLUMN, ROW) , 2) +
c   CRADIM (BANKNUM (COLUMN, ROW) , 4)
      IF (CURRENTSURF.GE.SURFVALUESPEC (UEFTOPSURF)) THEN
        CURRENTSURF=SURFVALUESPEC (UEFTOPSURF)
      ENDIF
      CURRENTSURFLABEL=0
      DO 4050 V=1, (SN-1)
        IF (SURFTYPESPEC (V).EQ.'PZ') THEN
      IF (ABS (SURFVALUESPEC (V)-CURRENTSURF).LT.(0.0001)) THEN
        CURRENTSURFLABEL=V
        EXIT
      ENDIF
      ENDIF
4050   CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
        CRASBOTOMSURF=SN
        SURFTYPESPEC (SN)='PZ'
        SURFVALUESPEC (SN)=CURRENTSURF
        SN=SN+1
      ELSE
        CRASBOTOMSURF=CURRENTSURFLABEL
      ENDIF
*   Define the CR cladding inner radius.
      CURRENTSURF=CRADIM (BANKNUM (COLUMN, ROW) , 2)
      CURRENTSURFLABEL=0
      DO 4060 V=1, (SN-1)
        IF (SURFTYPESPEC (V).EQ.'CZ') THEN
      IF (ABS (SURFVALUESPEC (V)-CURRENTSURF).LT.(0.0001)) THEN
        CURRENTSURFLABEL=V
        EXIT
      ENDIF
      ENDIF
4060   CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
        CRCLADIRSURF=SN
        SURFTYPESPEC (SN)='CZ'
        SURFVALUESPEC (SN)=CURRENTSURF
        SN=SN+1
      ELSE
        CRCLADIRSURF=CURRENTSURFLABEL
      ENDIF
*   Define the CR cladding outer radius.
      CURRENTSURF=CRADIM (BANKNUM (COLUMN, ROW) , 3)
      CURRENTSURFLABEL=0
      DO 4070 V=1, (SN-1)
        IF (SURFTYPESPEC (V).EQ.'CZ') THEN
      IF (ABS (SURFVALUESPEC (V)-CURRENTSURF).LT.(0.0001)) THEN
        CURRENTSURFLABEL=V
        EXIT
      ENDIF
      ENDIF
4070   CONTINUE

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 304 of 647

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        IF (CURRENTSURFLABEL.EQ.0) THEN
            CRCLADORSURF=SN
            SURFTYPESPEC(SN)='CZ'
            SURFVALUESPEC(SN)=CURRENTSURF
            SN=SN+1
        ELSE
            CRCLADORSURF=CURRENTSURFLABEL
        ENDIF
*   Define the CR cladding top surface.
        CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)+
c       CRADIM(BANKNUM(COLUMN,ROW),4)+
c       CRADIM(BANKNUM(COLUMN,ROW),5)+
c       CRADIM(BANKNUM(COLUMN,ROW),7)
        IF (CURRENTSURF.GE.SURFVALUESPEC(UEFTOPSURF)) THEN
            CURRENTSURF=SURFVALUESPEC(UEFTOPSURF)
        ENDIF
        CURRENTSURFLABEL=0
        DO 4080 V=1,(SN-1)
            IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
4080    CONTINUE
        IF (CURRENTSURFLABEL.EQ.0) THEN
            CRCLADTOPSURF=SN
            SURFTYPESPEC(SN)='PZ'
            SURFVALUESPEC(SN)=CURRENTSURF
            SN=SN+1
        ELSE
            CRCLADTOPSURF=CURRENTSURFLABEL
        ENDIF
*   Define the CR cladding bottom surface.
        CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)+
c       CRADIM(BANKNUM(COLUMN,ROW),4)-
c       CRADIM(BANKNUM(COLUMN,ROW),6)
        IF (CURRENTSURF.GE.SURFVALUESPEC(UEFTOPSURF)) THEN
            CURRENTSURF=SURFVALUESPEC(UEFTOPSURF)
        ENDIF
        CURRENTSURFLABEL=0
        DO 4090 V=1,(SN-1)
            IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
4090    CONTINUE
        IF (CURRENTSURFLABEL.EQ.0) THEN
            CRCLADBOTTOMSURF=SN
            SURFTYPESPEC(SN)='PZ'
            SURFVALUESPEC(SN)=CURRENTSURF
            SN=SN+1

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 305 of 647

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ELSE
  CRCLADBOTTOMSURF=CURRENTSURFLABEL
ENDIF
IF (SURFVALUESPEC (CRABSBOTTOMSURF) .LT.
  c SURFVALUESPEC (UEFTOPSURF)) THEN
* Check Control Rod Absorber Material
  DO 4123 C=1,CRABSMAT (BANKNUM (COLUMN,ROW) ,2)
    IF (C.EQ.1) THEN
      WRITE (200,4121) CRABSML,
      c CRABSZAIDS (BANKNUM (COLUMN,ROW) ,C) ,
      c (-1*CRABSWTS (BANKNUM (COLUMN,ROW) ,C)) ,
      c ASSYID (COLUMN,ROW)
4121 FORMAT (T1, 'M', I4, T9, A9, 3X, G14.6,
      c ' $ Control Rod Absorber Material in Assembly ',
      c A5)
      ELSE
      c WRITE (200,4122) CRABSZAIDS (BANKNUM (COLUMN,ROW) ,C) ,
      c (-1*CRABSWTS (BANKNUM (COLUMN,ROW) ,C) )
4122 FORMAT (T9, A9, 3X, G14.6)
      ENDIF
4123 CONTINUE
      MN=MN+1
* Write the CR absorber cell in this CR universe.
      WRITE (30,4130) LN, CRABSML,
      c (-1*CRABSMAT (BANKNUM (COLUMN,ROW) ,1)) , (-1*CRABSSURF) ,
      c (-1*CRABSTOPSURF) , CRABSBOTTOMSURF,
      c CRAUNIV (COLUMN,ROW)
4130 FORMAT (T1, I4, T6, I4, T11, F10.6, T25, I4, 1X, I4, 1X, I4,
      c ' IMP:N=1 U=', I3, ' $ Control rod absorber material' )
      LN=LN+1
* Write the absorber-to-cladding gap cell in this CR universe.
      WRITE (30,4140) LN, (-1*CRCLADIRSURF) , CRABSSURF,
      c (-1*CRABSTOPSURF) ,
      c CRABSBOTTOMSURF, CRAUNIV (COLUMN,ROW)
4140 FORMAT (T1, I4, T6, '0', T25, I4, 1X, I4, 1X, I4, 1X, I4,
      c ' IMP:N=1 U=', I3, ' $ Absorber-to-cladding gap' )
      LN=LN+1
      ENDIF
* Write the CR cladding cell in this CR universe.
* Determine if the CR cladding material specification has
* previously been defined. If it has been previously defined, determine
* the cladding material specification label.
      CLADMLUNIQUE=.TRUE.
      LEAVE=.FALSE.
      IF ((COLUMN.NE.1) .AND. (ROW.NE.1)) THEN
        DO 4160 RO=1, (ROW-1)
          DO 4150 CO=1, 50
            IF (BANKNUM (CO,RO) .NE.0) THEN
              IF (BANKDES (BANKNUM (CO,RO)) .EQ. 'CRA ') THEN
                IF (CRCLADMAT (BANKNUM (COLUMN,ROW)) .EQ.
      c CRCLADMAT (BANKNUM (CO,RO)) ) THEN
                  CLADMLUNIQUE=.FALSE.
                  LEAVE=.TRUE.
                  CRCLADML (COLUMN,ROW) =CRCLADML (CO,RO)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV.00

Attachment I, Page 306 of 647

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                EXIT
            ENDIF
        ENDIF
        ENDIF
4150        CONTINUE
            IF (LEAVE.EQ..TRUE.) THEN
                EXIT
            ENDIF
4160        CONTINUE
            IF (LEAVE.EQ..FALSE.) THEN
                DO 4180 RO=ROW,ROW
                    DO 4170 CO=1,(COLUMN-1)
                        IF (BANKNUM(CO,RO).NE.0) THEN
                            IF (BANKDES(BANKNUM(CO,RO)).EQ.'CRA ') THEN
                                IF (CRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.
c                                CRCLADMAT(BANKNUM(CO,RO))) THEN
                                    CLADMLUNIQUE=.FALSE.
                                    LEAVE=.TRUE.
                                    CRCLADML(COLUMN,ROW)=CRCLADML(CO,RO)
                                    EXIT
                                ENDIF
                            ENDIF
                        ENDIF
                    CONTINUE
                    IF (LEAVE.EQ..TRUE.) THEN
                        EXIT
                    ENDIF
4170        CONTINUE
                ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
                    DO 4200 RO=1,(ROW-1)
                        DO 4190 CO=1,50
                            IF (BANKNUM(CO,RO).NE.0) THEN
                                IF (BANKDES(BANKNUM(CO,RO)).EQ.'CRA ') THEN
                                    IF (CRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.
c                                    CRCLADMAT(BANKNUM(CO,RO))) THEN
                                        CLADMLUNIQUE=.FALSE.
                                        LEAVE=.TRUE.
                                        CRCLADML(COLUMN,ROW)=CRCLADML(CO,RO)
                                        EXIT
                                    ENDIF
                                ENDIF
                            ENDIF
                        CONTINUE
                        IF (LEAVE.EQ..TRUE.) THEN
                            EXIT
                        ENDIF
4190        CONTINUE
                    ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
                        DO 4220 RO=1,1
                            DO 4210 CO=1,(COLUMN-1)
                                IF (BANKNUM(CO,RO).NE.0) THEN
                                    IF (BANKDES(BANKNUM(CO,RO)).EQ.'CRA ') THEN
                                        IF (CRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 307 of 647

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      c          CRCLADMAT(BANKNUM(CO,RO)) THEN
                CLADMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                CRCLADML(COLUMN,ROW)=CRCLADML(CO,RO)
                EXIT
            ENDIF
        ENDIF
        ENDIF
4210      CONTINUE
        IF (LEAVE.EQ..TRUE.) THEN
            EXIT
        ENDIF
4220      CONTINUE
        ENDIF
        IF (SURFVALUESPEC(CRCLADBOTTOMSURF).LT.
      c  SURFVALUESPEC(UEFTOPSURF)) THEN
            IF (CLADMLUNIQUE.EQ..TRUE.) THEN
                CRCLADML(COLUMN,ROW)=MN
* Check Control Rod Cladding
                IF (CRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.1) THEN
                    DO 4222 C=1,2
                        IF (C.EQ.1) THEN
                            WRITE(200,9300) CRCLADML(COLUMN,ROW)
                        ELSEIF (C.EQ.2) THEN
                            WRITE(200,9301)
                            WRITE(200,7000)
                            WRITE(200,7001)
                            WRITE(200,7002)
                            WRITE(200,9302)
                            WRITE(200,7003)
                            WRITE(200,7004)
                            WRITE(200,7005)
                            WRITE(200,9303)
                            WRITE(200,9304)
                        ENDIF
                    CONTINUE
4222      ELSEIF (CRCLADMAT(BANKNUM(COLUMN,ROW))
      c      .EQ.2) THEN
                        DO 4224 C=1,2
                            IF (C.EQ.1) THEN
                                WRITE(200,9305) CRCLADML(COLUMN,ROW)
                            ELSEIF (C.EQ.2) THEN
                                WRITE(200,9306)
                                WRITE(200,9307)
                                WRITE(200,9308)
                                WRITE(200,9309)
                                WRITE(200,9310)
                                WRITE(200,7006)
                                WRITE(200,7007)
                                WRITE(200,7008)
                                WRITE(200,9311)
                                WRITE(200,9312)
                                WRITE(200,7009)
                                WRITE(200,7010)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 308 of 647

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        WRITE(200,7011)
        WRITE(200,9313)
        WRITE(200,7012)
        WRITE(200,7013)
        WRITE(200,7014)
        WRITE(200,7015)
    ENDIF
4224    CONTINUE
    ELSEIF (CRCLADMAT(BANKNUM(COLUMN,ROW))
c      .EQ.3) THEN
    DO 4226 C=1,2
    IF (C.EQ.1) THEN
        WRITE(200,9314) CRCLADML(COLUMN,ROW)
    ELSEIF (C.EQ.2) THEN
        WRITE(200,9315)
        WRITE(200,9316)
        WRITE(200,9317)
        WRITE(200,9318)
        WRITE(200,7016)
        WRITE(200,7017)
        WRITE(200,7018)
        WRITE(200,9319)
        WRITE(200,9320)
        WRITE(200,7019)
        WRITE(200,7020)
        WRITE(200,7021)
        WRITE(200,9321)
        WRITE(200,7022)
        WRITE(200,7023)
        WRITE(200,7024)
        WRITE(200,7025)
        WRITE(200,9322)
        WRITE(200,9323)
        WRITE(200,9324)
        WRITE(200,9325)
        WRITE(200,9326)
        WRITE(200,9327)
        WRITE(200,7026)
        WRITE(200,9328)
        WRITE(200,9329)
        WRITE(200,9330)
    ENDIF
4226    CONTINUE
    ENDIF
    MN=MN+1
    ENDIF
    IF (CRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.1) THEN
        CLADRHO=6.56
    ELSEIF (CRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.2) THEN
        CLADRHO=7.90
    ELSEIF (CRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.3) THEN
        CLADRHO=8.19
    ENDIF
    WRITE(30,4238) LN, CRCLADML(COLUMN,ROW), (-1*CLADRHO),
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 309 of 647

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c      CRCLADIRSURF,
c      (-1*CRCLADORSURF), (-1*CRCLADTOPSURF), CRCLADBOTTOMSURF,
c      CRAUNIV(COLUMN,ROW)
4238  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Control rod cladding')
      LN=LN+1
      ENDIF
*      Write the CR upper plenum cell in this CR universe.
*      Determine if the CR upper plenum material specification has
*      previously been defined. If it has been previously defined, determine
*      the upper plenum material specification label.
      CRUPLUNIQUE=.TRUE.
      LEAVE=.FALSE.
      IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
        DO 4250 RO=1,(ROW-1)
          DO 4240 CO=1,50
            IF (BANKNUM(CO,RO).NE.0) THEN
              IF (BANKNUM(COLUMN,ROW).EQ.
c              BANKNUM(CO,RO)) THEN
                CRUPLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                CRUPL(COLUMN,ROW)=CRUPL(CO,RO)
                EXIT
              ENDIF
            ENDIF
          CONTINUE
        IF (LEAVE.EQ..TRUE.) THEN
          EXIT
        ENDIF
      CONTINUE
4250  IF (LEAVE.EQ..FALSE.) THEN
        DO 4270 RO=ROW,ROW
          DO 4260 CO=1,(COLUMN-1)
            IF (BANKNUM(CO,RO).NE.0) THEN
              IF (BANKNUM(COLUMN,ROW).EQ.
c              BANKNUM(CO,RO)) THEN
                CRUPLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                CRUPL(COLUMN,ROW)=CRUPL(CO,RO)
                EXIT
              ENDIF
            ENDIF
          CONTINUE
        IF (LEAVE.EQ..TRUE.) THEN
          EXIT
        ENDIF
      CONTINUE
4260  CONTINUE
      IF (LEAVE.EQ..TRUE.) THEN
        EXIT
      ENDIF
4270  CONTINUE
      ENDIF
      ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
        DO 4290 RO=1,(ROW-1)
          DO 4280 CO=1,50
            IF (BANKNUM(CO,RO).NE.0) THEN
              IF (BANKNUM(COLUMN,ROW).EQ.
c              BANKNUM(CO,RO)) THEN

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 310 of 647

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                CRUPMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                CRUPML(COLUMN,ROW)=CRUPML(CO,RO)
                EXIT
            ENDIF
        ENDIF
4280    CONTINUE
        IF (LEAVE.EQ..TRUE.) THEN
            EXIT
        ENDIF
4290    CONTINUE
        ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
            DO 4310 RO=1,1
                DO 4300 CO=1,(COLUMN-1)
                    IF (BANKNUM(CO,RO).NE.0) THEN
                        IF (BANKNUM(COLUMN,ROW).EQ.
c         BANKNUM(CO,RO)) THEN
                            CRUPMLUNIQUE=.FALSE.
                            LEAVE=.TRUE.
                            CRUPML(COLUMN,ROW)=CRUPML(CO,RO)
                            EXIT
                        ENDIF
                    ENDIF
4300    CONTINUE
            IF (LEAVE.EQ..TRUE.) THEN
                EXIT
            ENDIF
4310    CONTINUE
        ENDIF
        IF (SURFVALUESPEC(CRABSTOPSURF).LT.
c     SURFVALUESPEC(UEFTOPSURF)) THEN
            IF (CRUPMLUNIQUE.EQ..TRUE.) THEN
                CRUPML(COLUMN,ROW)=MN
* Check Control Rod Upper Plenum Regions
                DO 4313 C=1,CRUPLENMAT(BANKNUM(COLUMN,ROW),2)
                    IF (C.EQ.1) THEN
                        WRITE(200,4311) CRUPML(COLUMN,ROW),
c         CRUPZS(BANKNUM(COLUMN,ROW),C),
c         (-1*CRUPLENWTS(BANKNUM(COLUMN,ROW),C))
4311    FORMAT(T1,'M',I4,T9,A9,3X,G14.6,
c         '$ Control Rod Upper Plenum')
                    ELSE
                        WRITE(200,4312)
c         CRUPZS(BANKNUM(COLUMN,ROW),C),
c         (-1*CRUPLENWTS(BANKNUM(COLUMN,ROW),C))
4312    FORMAT(T9,A9,3X,G14.6)
                    ENDIF
4313    CONTINUE
                MN=MN+1
            ENDIF
            WRITE(30,4320) LN, CRUPML(COLUMN,ROW),
c     (-1*CRUPLENMAT(BANKNUM(COLUMN,ROW),1)),
c     CRABSTOPSURF,
c     (-1*CRCLADTOPSURF), (-1*CRCLADIRSURF),

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 311 of 647

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c      CRAUNIV(COLUMN,ROW)
4320  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Control rod upper plenum')
      LN=LN+1
      ENDIF
*      Write the CR lower plenum cell in this CR universe.
*      Determine if the CR lower plenum material specification has
*      previously been defined.  If it has been previously defined, determine
*      the lower plenum material specification label.
      CRLPMLUNIQUE=.TRUE.
      LEAVE=.FALSE.
      IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
        DO 4340 RO=1,(ROW-1)
          DO 4330 CO=1,50
            IF (BANKNUM(CO,RO).NE.0) THEN
              IF (BANKNUM(COLUMN,ROW).EQ.BANKNUM(CO,RO)) THEN
                CRLPMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                CRLPML(COLUMN,ROW)=CRLPML(CO,RO)
                EXIT
              ENDIF
            ENDIF
          CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
        CONTINUE
        IF (LEAVE.EQ..FALSE.) THEN
          DO 4360 RO=ROW,ROW
            DO 4350 CO=1,(COLUMN-1)
              IF (BANKNUM(CO,RO).NE.0) THEN
                IF (BANKNUM(COLUMN,ROW).EQ.
c                BANKNUM(CO,RO)) THEN
                  CRLPMLUNIQUE=.FALSE.
                  LEAVE=.TRUE.
                  CRLPML(COLUMN,ROW)=CRLPML(CO,RO)
                  EXIT
                ENDIF
              ENDIF
            CONTINUE
            IF (LEAVE.EQ..TRUE.) THEN
              EXIT
            ENDIF
          CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
        CONTINUE
        IF (LEAVE.EQ..FALSE.) THEN
          DO 4380 RO=1,(ROW-1)
            DO 4370 CO=1,50
              IF (BANKNUM(CO,RO).NE.0) THEN
                IF (BANKNUM(COLUMN,ROW).EQ.
c                BANKNUM(CO,RO)) THEN
                  CRLPMLUNIQUE=.FALSE.
                  LEAVE=.TRUE.
                  CRLPML(COLUMN,ROW)=CRLPML(CO,RO)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 312 of 647

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                EXIT
            ENDIF
        ENDIF
4370      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
4380      CONTINUE
          ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
            DO 4400 RO=1,1
              DO 4390 CO=1,(COLUMN-1)
                IF (BANKNUM(CO,RO).NE.0) THEN
                  IF (BANKNUM(COLUMN,ROW).EQ.
c          BANKNUM(CO,RO)) THEN
                    CRLPMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    CRLPML(COLUMN,ROW)=CRLPML(CO,RO)
                    EXIT
                ENDIF
              ENDIF
            ENDIF
4390      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
4400      CONTINUE
          ENDIF
          IF (SURFVALUESPEC(CRCLADBOTTOMSURF).LT.
c          SURFVALUESPEC(UFTOPSURF)) THEN
            IF (CRLPMLUNIQUE.EQ..TRUE.) THEN
              CRLPML(COLUMN,ROW)=MN
* Check Control Rod Lower Plenum Regions
              DO 4403 C=1,CRLPLENMAT(BANKNUM(COLUMN,ROW),2)
                IF (C.EQ.1) THEN
                  WRITE(200,4401) CRLPML(COLUMN,ROW),
c          CRLPLENZAIDS(BANKNUM(COLUMN,ROW),C),
c          (-1*CRLPLENWTS(BANKNUM(COLUMN,ROW),C))
4401      FORMAT(T1,'M',I4,T9,A9,3X,G14.6,
c          '$ Control Rod Lower Plenum')
                ELSE
                  WRITE(200,4402)
c          CRLPLENZAIDS(BANKNUM(COLUMN,ROW),C),
c          (-1*CRLPLENWTS(BANKNUM(COLUMN,ROW),C))
4402      FORMAT(T9,A9,3X,G14.6)
                ENDIF
              ENDIF
4403      CONTINUE
              MN=MN+1
            ENDIF
            WRITE(30,4410) LN, CRLPML(COLUMN,ROW),
c          (-1*CRLPLENMAT(BANKNUM(COLUMN,ROW),1)), CRCLADBOTTOMSURF,
c          (-1*CRABSBOTTOMSURF), (-1*CRCLADIRSURF),
c          CRAUNIV(COLUMN,ROW)
4410      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I3,' $ Control rod lower plenum')
            LN=LN+1

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 313 of 647

```
      ENDIF
*   Define the GT top surface.
      CURRENTSURF=GTDATA (DESNUM (COLUMN, ROW) , 3)
      IF (CURRENTSURF.GT.SURFVALUESPEC (UEFTOPSURF)) THEN
        CURRENTSURF=SPACERDIST (DESNUM (COLUMN, ROW) , 1) +
c      ENDFITHEIGHT (DESNUM (COLUMN, ROW) , 1)
      ENDIF
      CURRENTSURFLABEL=0
      DO 4420 V=1, (SN-1)
        IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
          IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
            CURRENTSURFLABEL=V
            EXIT
          ENDIF
        ENDIF
4420      CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
        GTTOPSURF=SN
        SURFTYPESPEC (SN)='PZ'
        SURFVALUESPEC (SN)=CURRENTSURF
        SN=SN+1
      ELSE
        GTTOPSURF=CURRENTSURFLABEL
      ENDIF
*   Define the GT bottom surface.
      CURRENTSURF=GTDATA (DESNUM (COLUMN, ROW) , 4)
      CURRENTSURFLABEL=0
      DO 4430 V=1, (SN-1)
        IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
          IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
            CURRENTSURFLABEL=V
            EXIT
          ENDIF
        ENDIF
4430      CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
        GTBOTSURF=SN
        SURFTYPESPEC (SN)='PZ'
        SURFVALUESPEC (SN)=CURRENTSURF
        SN=SN+1
      ELSE
        GTBOTSURF=CURRENTSURFLABEL
      ENDIF
*   Define the GT outer radius surface.
      CURRENTSURF=GTDATA (DESNUM (COLUMN, ROW) , 2)
      CURRENTSURFLABEL=0
      DO 4440 V=1, (SN-1)
        IF (SURFTYPESPEC (V) .EQ. 'CZ') THEN
          IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
            CURRENTSURFLABEL=V
            EXIT
          ENDIF
        ENDIF
4440      CONTINUE
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 314 of 647

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        IF (CURRENTSURFLABEL.EQ.0) THEN
            GTORSURF=SN
            SURFTYPESPEC(SN)='CZ'
            SURFVALUESPEC(SN)=CURRENTSURF
            SN=SN+1
        ELSE
            GTORSURF=CURRENTSURFLABEL
        ENDIF
*   Define the GT inner radius surface.
        CURRENTSURF=GTDATA(DESNUM(COLUMN,ROW),1)
        CURRENTSURFLABEL=0
        DO 4450 V=1,(SN-1)
            IF (SURFTYPESPEC(V).EQ.'CZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
4450    CONTINUE
        IF (CURRENTSURFLABEL.EQ.0) THEN
            GTIRSURF=SN
            SURFTYPESPEC(SN)='CZ'
            SURFVALUESPEC(SN)=CURRENTSURF
            SN=SN+1
        ELSE
            GTIRSURF=CURRENTSURFLABEL
        ENDIF
*   Define the lower end-fitting top surface.
        CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
        CURRENTSURFLABEL=0
        DO 4460 V=1,(SN-1)
            IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
4460    CONTINUE
        IF (CURRENTSURFLABEL.EQ.0) THEN
            CRLEFTTOPSURF=SN
            SURFTYPESPEC(SN)='PZ'
            SURFVALUESPEC(SN)=CURRENTSURF
            SN=SN+1
        ELSE
            CRLEFTTOPSURF=CURRENTSURFLABEL
        ENDIF
*   Write the lower end-fitting cell specification for this CR universe.
        IF (SURFVALUESPEC(GTBOTSURF).GE.
c       ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)) THEN
            WRITE(30,4550) LN, FRLEFML(COLUMN,ROW),
c       (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*CRLEFTTOPSURF),
c       CRAUNIV(COLUMN,ROW)
4550    FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,' IMP:N=1 U=',I3,
c       '$ Lower end-fitting')

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 315 of 647

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LN=LN+1
ELSE
  WRITE(30,4560) LN, FRLEFML(COLUMN,ROW),
  (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*CRLEFTOPSURF),
  GTORSURF, CRAUNIV(COLUMN,ROW)
  4560  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
  ' IMP:N=1 U=',I3,' $ Lower end-fitting')
  LN=LN+1
  WRITE(30,4570) LN, FRLEFML(COLUMN,ROW),
  (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*GTBOTSURF),
  (-1*GTORSURF), CRAUNIV(COLUMN,ROW)
  4570  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
  ' IMP:N=1 U=',I3,' $ Lower end-fitting')
  LN=LN+1
ENDIF
* Write the upper end-fitting cell specification for this CR universe.
IF ((SURFVALUESPEC(GTTOPSURF).LE.
  SURFVALUESPEC(UEFBOTTOMSURF)).AND.
  (SURFVALUESPEC(CRCLADTOPSURF).GE.
  SURFVALUESPEC(UEFTOPSURF))) THEN
  WRITE(30,4572) LN, FRUEFML(COLUMN,ROW),
  (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
  (-1*UEFTOPSURF), CRCLADORSURF, CRAUNIV(COLUMN,ROW)
  4572  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
  ' IMP:N=1 U=',I3,' $ Upper end-fitting')
  LN=LN+1
ELSEIF ((SURFVALUESPEC(GTTOPSURF).LE.
  SURFVALUESPEC(UEFBOTTOMSURF)).AND.
  (SURFVALUESPEC(CRCLADTOPSURF).LT.
  SURFVALUESPEC(UEFTOPSURF)).AND.
  (SURFVALUESPEC(CRCLADTOPSURF).GT.
  SURFVALUESPEC(UEFBOTTOMSURF))) THEN
  WRITE(30,4574) LN, FRUEFML(COLUMN,ROW),
  (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
  (-1*UEFTOPSURF), CRCLADORSURF, CRAUNIV(COLUMN,ROW)
  4574  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
  ' IMP:N=1 U=',I3,' $ Upper end-fitting')
  LN=LN+1
  WRITE(30,4576) LN, FRUEFML(COLUMN,ROW),
  (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), CRCLADTOPSURF,
  (-1*UEFTOPSURF), (-1*CRCLADORSURF),
  CRAUNIV(COLUMN,ROW)
  4576  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
  ' IMP:N=1 U=',I3,' $ Upper end-fitting')
  LN=LN+1
ELSEIF ((SURFVALUESPEC(GTTOPSURF).LE.
  SURFVALUESPEC(UEFBOTTOMSURF)).AND.
  (SURFVALUESPEC(CRCLADTOPSURF).LE.
  SURFVALUESPEC(UEFBOTTOMSURF))) THEN
  WRITE(30,4578) LN, FRUEFML(COLUMN,ROW),
  (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
  (-1*UEFTOPSURF), CRAUNIV(COLUMN,ROW)
  4578  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
  ' IMP:N=1 U=',I3,' $ Upper end-fitting')

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 316 of 647

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LN=LN+1
ELSEIF ((SURFVALUESPEC(GTTOPSURF).LT.
C SURFVALUESPEC(UEFTOPSURF)).AND.
C (SURFVALUESPEC(GTTOPSURF).GT.
C SURFVALUESPEC(UEFBOTTOMSURF)).AND.
C (SURFVALUESPEC(CRCLADTOPSURF).GE.
C SURFVALUESPEC(UEFTOPSURF))) THEN
WRITE(30,4580) LN, FRUEFML(COLUMN,ROW),
C (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
C (-1*UEFTOPSURF), GTORSURF, CRAUNIV(COLUMN,ROW)
4580 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
C ' IMP:N=1 U=',I3,' $ Upper end-fitting')
LN=LN+1
WRITE(30,4582) LN, FRUEFML(COLUMN,ROW),
C (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), GTTOPSURF,
C (-1*UEFTOPSURF), (-1*GTORSURF), CRCLADORSURF,
C CRAUNIV(COLUMN,ROW)
4582 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
C 1X,I4,' IMP:N=1 U=',I3,' $ Upper end-fitting')
LN=LN+1
ELSEIF ((SURFVALUESPEC(GTTOPSURF).LT.
C SURFVALUESPEC(UEFTOPSURF)).AND.
C (SURFVALUESPEC(GTTOPSURF).GT.
C SURFVALUESPEC(UEFBOTTOMSURF)).AND.
C (SURFVALUESPEC(CRCLADTOPSURF).GE.
C SURFVALUESPEC(GTTOPSURF)).AND.
C (SURFVALUESPEC(CRCLADTOPSURF).LT.
C SURFVALUESPEC(UEFTOPSURF))) THEN
WRITE(30,4584) LN, FRUEFML(COLUMN,ROW),
C (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
C (-1*UEFTOPSURF), GTORSURF, CRAUNIV(COLUMN,ROW)
4584 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
C ' IMP:N=1 U=',I3,' $ Upper end-fitting')
LN=LN+1
WRITE(30,4586) LN, FRUEFML(COLUMN,ROW),
C (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), GTTOPSURF,
C (-1*UEFTOPSURF), CRCLADORSURF, (-1*GTORSURF),
C CRAUNIV(COLUMN,ROW)
4586 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
C 1X,I4,' IMP:N=1 U=',I3,' $ Upper end-fitting')
LN=LN+1
WRITE(30,4588) LN, FRUEFML(COLUMN,ROW),
C (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), CRCLADTOPSURF,
C (-1*UEFTOPSURF), (-1*CRCLADORSURF),
C CRAUNIV(COLUMN,ROW)
4588 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
C ' IMP:N=1 U=',I3,' $ Upper end-fitting')
LN=LN+1
ELSEIF ((SURFVALUESPEC(GTTOPSURF).LT.
C SURFVALUESPEC(UEFTOPSURF)).AND.
C (SURFVALUESPEC(GTTOPSURF).GT.
C SURFVALUESPEC(UEFBOTTOMSURF)).AND.
C (SURFVALUESPEC(CRCLADTOPSURF).EQ.
C SURFVALUESPEC(GTTOPSURF))) THEN

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 317 of 647

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WRITE(30,4590) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTOMSURF,
c      (-1*UEFTOPSURF), GTORSURF, CRAUNIV(COLUMN,ROW)
4590  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Upper end-fitting')
      LN=LN+1
WRITE(30,4592) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), GTTOPSURF,
c      (-1*UEFTOPSURF), (-1*GTORSURF),
c      CRAUNIV(COLUMN,ROW)
4592  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Upper end-fitting')
      LN=LN+1
ELSEIF ((SURFVALUESPEC(GTTOPSURF).LT.
c      SURFVALUESPEC(UEFTOPSURF)).AND.
c      (SURFVALUESPEC(GTTOPSURF).GT.
c      SURFVALUESPEC(UEFBOTOMSURF)).AND.
c      (SURFVALUESPEC(CRCLADTOPSURF).LT.
c      SURFVALUESPEC(GTTOPSURF)).AND.
c      (SURFVALUESPEC(CRCLADTOPSURF).GT.
c      SURFVALUESPEC(UEFBOTOMSURF)))) THEN
      WRITE(30,4594) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTOMSURF,
c      (-1*UEFTOPSURF), GTORSURF, CRAUNIV(COLUMN,ROW)
4594  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Upper end-fitting')
      LN=LN+1
      WRITE(30,4596) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), GTTOPSURF,
c      (-1*UEFTOPSURF), (-1*GTORSURF),
c      CRAUNIV(COLUMN,ROW)
4596  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Upper end-fitting')
      LN=LN+1
      WRITE(30,4598) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), (-1*GTTOPSURF),
c      CRCLADTOPSURF, (-1*CRCLADORSURF),
c      CRAUNIV(COLUMN,ROW)
4598  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Upper end-fitting')
      LN=LN+1
ELSEIF ((SURFVALUESPEC(GTTOPSURF).LT.
c      SURFVALUESPEC(UEFTOPSURF)).AND.
c      (SURFVALUESPEC(GTTOPSURF).GT.
c      SURFVALUESPEC(UEFBOTOMSURF)).AND.
c      (SURFVALUESPEC(CRCLADTOPSURF).LE.
c      SURFVALUESPEC(UEFBOTOMSURF)))) THEN
      WRITE(30,4600) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTOMSURF,
c      (-1*UEFTOPSURF), GTORSURF, CRAUNIV(COLUMN,ROW)
4600  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Upper end-fitting')
      LN=LN+1
      WRITE(30,4602) LN, FRUEFML(COLUMN,ROW),
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 318 of 647

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c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), GTTOPSURF,
c      (-1*UEFTOPSURF), (-1*GTORSURF),
c      CRAUNIV(COLUMN,ROW)
4602  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Upper end-fitting')
      LN=LN+1
      WRITE(30,4604) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), (-1*GTTOPSURF),
c      UEFBOTTOMSURF, (-1*CRCLADORSURF),
c      CRAUNIV(COLUMN,ROW)
4604  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Upper end-fitting')
      LN=LN+1
      ELSEIF ((SURFVALUESPEC(GTTOPSURF).GE.
c      SURFVALUESPEC(UEFTOPSURF)).AND.
c      (SURFVALUESPEC(CRCLADTOPSURF).GE.
c      SURFVALUESPEC(UEFTOPSURF))) THEN
      WRITE(30,4606) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c      (-1*UEFTOPSURF), GTORSURF, CRAUNIV(COLUMN,ROW)
4606  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Upper end-fitting')
      LN=LN+1
      ELSEIF ((SURFVALUESPEC(GTTOPSURF).GE.
c      SURFVALUESPEC(UEFTOPSURF)).AND.
c      (SURFVALUESPEC(CRCLADTOPSURF).LE.
c      SURFVALUESPEC(UEFBOTTOMSURF))) THEN
      WRITE(30,4608) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c      (-1*UEFTOPSURF), GTORSURF, CRAUNIV(COLUMN,ROW)
4608  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Upper end-fitting')
      LN=LN+1
      WRITE(30,4610) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c      (-1*UEFTOPSURF), (-1*CRCLADORSURF), CRAUNIV(COLUMN,ROW)
4610  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Upper end-fitting')
      LN=LN+1
      ELSEIF ((SURFVALUESPEC(GTTOPSURF).GE.
c      SURFVALUESPEC(UEFTOPSURF)).AND.
c      (SURFVALUESPEC(CRCLADTOPSURF).GT.
c      SURFVALUESPEC(UEFBOTTOMSURF)).AND.
c      (SURFVALUESPEC(CRCLADTOPSURF).LT.
c      SURFVALUESPEC(UEFTOPSURF))) THEN
      WRITE(30,4612) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c      (-1*UEFTOPSURF), GTORSURF, CRAUNIV(COLUMN,ROW)
4612  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Upper end-fitting')
      LN=LN+1
      WRITE(30,4614) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), CRCLADTOPSURF,
c      (-1*UEFTOPSURF), (-1*CRCLADORSURF), CRAUNIV(COLUMN,ROW)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 319 of 647

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4614          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c             ' IMP:N=1 U=',I3,' $ Upper end-fitting')
          LN=LN+1
          ENDIF
*           Write the GT material cell in this CR universe.
*           Determine if the GT material specification has
*           previously been defined.  If it has been previously defined, determine
*           the material specification label.
          CLADMLUNIQUE=.TRUE.
          LEAVE=.FALSE.
          IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
            DO 4710 RO=1,(ROW-1)
              DO 4700 CO=1,50
                IF (DESNUM(CO,RO).NE.0) THEN
                  IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.
c                 GTMAT(DESNUM(CO,RO))) THEN
                    CLADMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    GTML(COLUMN,ROW)=GTML(CO,RO)
                    EXIT
                  ENDIF
                ENDIF
              ENDIF
            CONTINUE
            IF (LEAVE.EQ..TRUE.) THEN
              EXIT
            ENDIF
          CONTINUE
          IF (LEAVE.EQ..FALSE.) THEN
            DO 4730 RO=ROW,ROW
              DO 4720 CO=1,(COLUMN-1)
                IF (DESNUM(CO,RO).NE.0) THEN
                  IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.
c                 GTMAT(DESNUM(CO,RO))) THEN
                    CLADMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    GTML(COLUMN,ROW)=GTML(CO,RO)
                    EXIT
                  ENDIF
                ENDIF
              CONTINUE
            IF (LEAVE.EQ..TRUE.) THEN
              EXIT
            ENDIF
          CONTINUE
          CONTINUE
          ENDIF
          ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
            DO 4750 RO=1,(ROW-1)
              DO 4740 CO=1,50
                IF (DESNUM(CO,RO).NE.0) THEN
                  IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.
c                 GTMAT(DESNUM(CO,RO))) THEN
                    CLADMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    GTML(COLUMN,ROW)=GTML(CO,RO)

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 320 of 647

```

                EXIT
            ENDIF
        ENDIF
4740      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
4750      CONTINUE
          ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
            DO 4770 RO=1,1
              DO 4760 CO=1,(COLUMN-1)
                IF (DESNUM(CO,RO).NE.0) THEN
                  IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.
c          GTMAT(DESNUM(CO,RO))) THEN
                    CLADMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    GTML(COLUMN,ROW)=GTML(CO,RO)
                    EXIT
                ENDIF
              ENDIF
            ENDIF
4760      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
4770      CONTINUE
          ENDIF
          IF (CLADMLUNIQUE.EQ..TRUE.) THEN
            GTML(COLUMN,ROW)=MN
* Check Guide Tube Material
            IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.1) THEN
              DO 4772 C=1,2
                IF (C.EQ.1) THEN
                  WRITE(200,9300) GTML(COLUMN,ROW)
                ELSEIF (C.EQ.2) THEN
                  WRITE(200,9301)
                  WRITE(200,7000)
                  WRITE(200,7001)
                  WRITE(200,7002)
                  WRITE(200,9302)
                  WRITE(200,7003)
                  WRITE(200,7004)
                  WRITE(200,7005)
                  WRITE(200,9303)
                  WRITE(200,9304)
                ENDIF
            ENDIF
4772      CONTINUE
          ELSEIF (GTMAT(DESNUM(COLUMN,ROW))
c          .EQ.2) THEN
            DO 4774 C=1,2
              IF (C.EQ.1) THEN
                WRITE(200,9305) GTML(COLUMN,ROW)
              ELSEIF (C.EQ.2) THEN
                WRITE(200,9306)
                WRITE(200,9307)

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 321 of 647

```
WRITE(200,9308)
WRITE(200,9309)
WRITE(200,9310)
WRITE(200,7006)
WRITE(200,7007)
WRITE(200,7008)
WRITE(200,9311)
WRITE(200,9312)
WRITE(200,7009)
WRITE(200,7010)
WRITE(200,7011)
WRITE(200,9313)
WRITE(200,7012)
WRITE(200,7013)
WRITE(200,7014)
WRITE(200,7015)
ENDIF
4774 CONTINUE
      ELSEIF (GTMAT(DESNUM(COLUMN,ROW)
C      .EQ.3) THEN
      DO 4776 C=1,2
      IF (C.EQ.1) THEN
      WRITE(200,9314) GTML(COLUMN,ROW)
      ELSEIF (C.EQ.2) THEN
      WRITE(200,9315)
      WRITE(200,9316)
      WRITE(200,9317)
      WRITE(200,9318)
      WRITE(200,7016)
      WRITE(200,7017)
      WRITE(200,7018)
      WRITE(200,9319)
      WRITE(200,9320)
      WRITE(200,7019)
      WRITE(200,7020)
      WRITE(200,7021)
      WRITE(200,9321)
      WRITE(200,7022)
      WRITE(200,7023)
      WRITE(200,7024)
      WRITE(200,7025)
      WRITE(200,9322)
      WRITE(200,9323)
      WRITE(200,9324)
      WRITE(200,9325)
      WRITE(200,9326)
      WRITE(200,9327)
      WRITE(200,7026)
      WRITE(200,9328)
      WRITE(200,9329)
      WRITE(200,9330)
      ENDIF
4776 CONTINUE
ENDIF
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 322 of 647

```

      MN=MN+1
    ENDIF
    IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.1) THEN
      CLADRHO=6.56
    ELSEIF (GTMAT(DESNUM(COLUMN,ROW)).EQ.2) THEN
      CLADRHO=7.90
    ELSEIF (GTMAT(DESNUM(COLUMN,ROW)).EQ.3) THEN
      CLADRHO=8.19
    ENDIF
    WRITE(30,4788) LN, GTML(COLUMN,ROW), (-1*CLADRHO),
  c   GTIRSURF,
  c   (-1*GTORSURF), (-1*GTTOPSURF), GTBOTSURF,
  c   CRAUNIV(COLUMN,ROW)
4788  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
  c   ' IMP:N=1 U=',I3,' $ Guide tube region')
      LN=LN+1
*   Write the moderator cells within the GT in this CR universe.
      WRITE(30,4790) LN, BMODML, (-1*MODDENSITY),
  c   (-1*GTIRSURF),
  c   CRCLADORSURF, (-1*GTTOPSURF), GTBOTSURF,
  c   CRAUNIV(COLUMN,ROW)
4790  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
  c   ' IMP:N=1 U=',I3,
  c   ' $ Borated moderator inside guide tube')
      LN=LN+1
      WRITE(30,4800) LN, BMODML, (-1*MODDENSITY),
  c   (-1*CRCLADORSURF), (-1*CRCLADBOTTOMSURF), GTBOTSURF,
  c   CRAUNIV(COLUMN,ROW)
4800  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
  c   ' IMP:N=1 U=',I3,
  c   ' $ Borated moderator inside guide tube')
      LN=LN+1
*   Loop through the regions above the CR (i.e. the appropriate upper core
regions)
*   Define the upper region lower surface.
      DO 4950 REGION=1,NUMREGABOVECRA
*   Determine the current upper region's lower surface specification.
      IF (REGION.EQ.1) THEN
        REGIONTOPSURF=SYSTEMTOP
        CURRENTSURF=SURFVALUESPEC (SYSTEMTOP) -
  c   REGABOVECRA (REGION,1)
      ENDIF
  c   CURRENTSURF=SURFVALUESPEC (REGIONTOPSURF) -
  c   REGABOVECRA (REGION,1)
      IF (REGION.EQ.NUMREGABOVECRA) THEN
        REGIONBOTTOMSURF=UEFTOPSURF
      ELSE
        CURRENTSURFLABEL=0
        DO 4810 V=1, (SN-1)
          IF (SURFTYPESPEC(V).EQ.'PZ') THEN
            IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
              CURRENTSURFLABEL=V
            EXIT
          ENDIF
        ENDIF
      ENDIF

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 323 of 647

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                ENDIF
4810          CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    REGIONBOTTOMSURF=SN
                    SURFTYPESPEC(SN)='PZ'
                    SURFVALUESPEC(SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    REGIONBOTTOMSURF=CURRENTSURFLABEL
                ENDIF
            ENDIF
*   Write the cell specification for the CR universe upper region.
        IF (REGION.EQ.1) THEN
            WRITE(30,4940) LN, FRUREGIONML(COLUMN,ROW,REGION),
            (-1*REGABOVECRA(REGION,2)),
            REGIONBOTTOMSURF, CRAUNIV(COLUMN,ROW), REGION
            c          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,
4940          ' IMP:N=1 U=',I3,' $ Upper core region ',I2)
            c          LN=LN+1
            REGIONTOPSURF=REGIONBOTTOMSURF
        ELSE
            WRITE(30,4945) LN, FRUREGIONML(COLUMN,ROW,REGION),
            (-1*REGABOVECRA(REGION,2)), (-1*REGIONTOPSURF),
            REGIONBOTTOMSURF, CRAUNIV(COLUMN,ROW), REGION
            c          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
4945          ' IMP:N=1 U=',I3,' $ Upper core region ',I2)
            c          LN=LN+1
            REGIONTOPSURF=REGIONBOTTOMSURF
        ENDIF
4950          CONTINUE
            SPACHEIGHT=0.0
*   Loop through the spacer and moderator regions along the axial
*   length of the GT (from top to bottom).
            DO 4951 SPN=1,NUMOFSPACERS(DESNUM(COLUMN,ROW))
                SPACHEIGHT=SPACHEIGHT+SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
4951          CONTINUE
            DO 5030 SPN=1,NUMOFSPACERS(DESNUM(COLUMN,ROW))
*   Define the homogenized spacer region bounding surfaces.
                IF (SPN.EQ.1) THEN
                    SPACERTOPSURF=UEFBOTTOMSURF
                    CURRENTSURF=SURFVALUESPEC(UEFBOTTOMSURF)-
                    c          SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
                    CURRENTSURFLABEL=0
                    DO 4960 V=1,(SN-1)
                        IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                            IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                                CURRENTSURFLABEL=V
                            EXIT
                        ENDIF
                    ENDIF
4960          CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    SPACERBOTTOMSURF=SN
                    SURFTYPESPEC(SN)='PZ'

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 324 of 647

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SURFVALUESPEC (SN) =CURRENTSURF
SN=SN+1
ELSE
  SPACERBOTTOMSURF=CURRENTSURFLABEL
ENDIF
WATERREGIONTOPSURF=SPACERBOTTOMSURF
CURRENTSURF=SPACERDIST (DESNUM (COLUMN, ROW) , (SPN+1))
CURRENTSURFLABEL=0
DO 4970 V=1, (SN-1)
  IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
  CURRENTSURFLABEL=V
  EXIT
  ENDIF
ENDIF
4970 CONTINUE
IF (CURRENTSURFLABEL .EQ. 0) THEN
  WATERREGIONBOTTOMSURF=SN
  SURFTYPESPEC (SN) = 'PZ'
  SURFVALUESPEC (SN) =CURRENTSURF
  SN=SN+1
ELSE
  WATERREGIONBOTTOMSURF=CURRENTSURFLABEL
ENDIF
ELSEIF ((SPN.NE.1) .AND. (SPN.NE.
c NUMOFSPACERS (DESNUM (COLUMN, ROW) ))) THEN
  SPACERTOPSURF=WATERREGIONBOTTOMSURF
  CURRENTSURF=SURFVALUESPEC (WATERREGIONBOTTOMSURF) -
c SPACERHEIGHT (DESNUM (COLUMN, ROW) , SPN)
  CURRENTSURFLABEL=0
  DO 4980 V=1, (SN-1)
    IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
  CURRENTSURFLABEL=V
  EXIT
  ENDIF
ENDIF
4980 CONTINUE
IF (CURRENTSURFLABEL .EQ. 0) THEN
  SPACERBOTTOMSURF=SN
  SURFTYPESPEC (SN) = 'PZ'
  SURFVALUESPEC (SN) =CURRENTSURF
  SN=SN+1
ELSE
  SPACERBOTTOMSURF=CURRENTSURFLABEL
ENDIF
WATERREGIONTOPSURF=SPACERBOTTOMSURF
CURRENTSURF=SPACERDIST (DESNUM (COLUMN, ROW) , (SPN+1))
CURRENTSURFLABEL=0
DO 4990 V=1, (SN-1)
  IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
  CURRENTSURFLABEL=V
  EXIT

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 325 of 647

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                ENDIF
                ENDIF
4990          CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    WATERREGIONBOTTOMSURF=SN
                    SURFTYPESPEC(SN)='PZ'
                    SURFVALUESPEC(SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    WATERREGIONBOTTOMSURF=CURRENTSURFLABEL
                ENDIF
                ELSEIF (SPN.EQ.NUMOFSPACERS(DESNUM(COLUMN,ROW))) THEN
                    SPACERTOPSURF=WATERREGIONBOTTOMSURF
                    CURRENTSURF=SURFVALUESPEC(WATERREGIONBOTTOMSURF)-
c             SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
                    CURRENTSURFLABEL=0
                    DO 5000 V=1,(SN-1)
                        IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                            IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                                CURRENTSURFLABEL=V
                                EXIT
                            ENDIF
                        ENDIF
                    ENDIF
5000          CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    SPACERBOTTOMSURF=SN
                    SURFTYPESPEC(SN)='PZ'
                    SURFVALUESPEC(SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    SPACERBOTTOMSURF=CURRENTSURFLABEL
                ENDIF
                WATERREGIONTOPSURF=SPACERBOTTOMSURF
                WATERREGIONBOTTOMSURF=NODEBOTTOMSURF
            ENDIF
*           Write the current homogenized spacer region cell in this CR universe.
                WRITE(30,5026) LN, HOMOSPACMLNUM(DESNUM(COLUMN,ROW),SPN),
c             (-1*HOMOSPACERDEN(DESNUM(COLUMN,ROW),SPN)), GTORSURF,
c             (-1*SPACERTOPSURF), SPACERBOTTOMSURF, CRAUNIV(COLUMN,ROW),
c             SPN
5026          FORMAT(T1,I4,T6,I4,T11,G14.8,T25,I4,1X,I4,1X,I4,
c             ' IMP:N=1 U=',I3,
c             '$ Homogenized region for spacer ',I2)
                LN=LN+1
*           Write the water region cell below the current homogenized spacer cell
in this CR universe.
                WRITE(30,5027) LN, BMODML, (-1*MODDENSITY), GTORSURF,
c             (-1*WATERREGIONTOPSURF), WATERREGIONBOTTOMSURF,
c             CRAUNIV(COLUMN,ROW)
5027          FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c             ' IMP:N=1 U=',I3,' $ Borated moderator')
                LN=LN+1
5030          CONTINUE
                ENDIF

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 326 of 647

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5040 CONTINUE
5050 CONTINUE
      ELSEIF (WESTINGHOUSE.EQ..TRUE.) THEN
        CALL WESTCRA (SPACERDIST, ENDFITHEIGHT, SURFVALUESPEC,
c CRADIM, CRABSMAT, CRABSWTS, CRUPLLENMAT, CRUPLLENWTS,
c CRLPLENMAT, CRLPLENWTS, GTDATA, LEFMAT,
c UEFMAT, MODDENSITY, REGABOVECRA, SPACERHEIGHT,
c HOMOSPACERDEN, MN, LN, CRAUNIV, BANKNUM, CRCLADMAT,
c CRCLADML, CRUPML, CRLPML, FRLEFML, FRUEFML, DESNUM,
c GTMAT, GTML, BMODML, NUMREGABOVECRA, SYSTEMTOP,
c FRUREGIONML, NUMOFSPACERS, HOMOSPACMLNUM, ASSYID,
c SURFTYPESPEC, CRABSZAIDS, BANKDES, CRUPZS, CRLPLENZZAIDS,
c CRUNIQUE, HYBRID, SN, CRAXCLADML, GTAXML, NUMCRAXS,
c GTAXMAT, NUMOFGTAXS, CRAXCLADMAT, GTUNIV,
c CRABSAXWTS, CRAXDIM, GTAXDATA, CRABSAXMAT,
c CRABSAXZAIDS, GTSPLIT, NODEBOTTOMSURF)
      ENDIF
      IF (BANDW.EQ..TRUE.) THEN
* Write the specifications for the APSR universes that are
* required to fill the assembly layout specifications previously defined.
        DO 6150 ROW=1,50
          DO 6140 COLUMN=1,50
* Write the APSR universe specification for the assembly if it
* contains a unique APSR material or unique APSR position.
*
          IF (APSRUNIQUE(COLUMN,ROW).EQ..TRUE.) THEN
* Write the CR specification header.
            WRITE(30,5060)
5060     FORMAT(T1,'C')
            WRITE(30,5070) ASSYID(COLUMN,ROW)
5070     FORMAT(T1,
c 'C AXIAL POWER SHAPING ROD UNIVERSE',
c ' SPECIFICATION FOR ASSEMBLY ',A5)
            WRITE(30,5080)
5080     FORMAT(T1,'C')
* Define the upper end-fitting bottom surface.
            CURRENTSURF=SPACERDIST (DESNUM(COLUMN,ROW),1)+
c ENDFITHEIGHT (DESNUM(COLUMN,ROW),2)
            CURRENTSURFLABEL=0
            DO 5082 V=1,(SN-1)
              IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                  CURRENTSURFLABEL=V
                  EXIT
                ENDIF
              ENDIF
            CONTINUE
5082     CONTINUE
            IF (CURRENTSURFLABEL.EQ.0) THEN
              UEFBOTTOMSURF=SN
              SURFTYPESPEC(SN)='PZ'
              SURFVALUESPEC(SN)=CURRENTSURF
              SN=SN+1
            ELSE
              UEFBOTTOMSURF=CURRENTSURFLABEL

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 327 of 647

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                ENDIF
*   Define the upper end-fitting top surface.
                CURRENTSURF=SPACERDIST (DESNUM (COLUMN,ROW) ,1) +
c           ENDFITHEIGHT (DESNUM (COLUMN,ROW) ,1) +
c           ENDFITHEIGHT (DESNUM (COLUMN,ROW) ,2)
                CURRENTSURFLABEL=0
                DO 5084 V=1, (SN-1)
                    IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
                        CURRENTSURFLABEL=V
                        EXIT
                    ENDIF
                ENDIF
5084          CONTINUE
                IF (CURRENTSURFLABEL .EQ. 0) THEN
                    UEFTOPSURF=SN
                    SURFTYPESPEC (SN) = 'PZ'
                    SURFVALUESPEC (SN) =CURRENTSURF
                    SN=SN+1
                ELSE
                    UEFTOPSURF=CURRENTSURFLABEL
                ENDIF
                APSRCLADTOPSURF=UEFTOPSURF
                APSRABSML=MN
*   Define the APSR absorber radius.
                CURRENTSURF=APSRADIM (BANKNUM (COLUMN,ROW) ,1)
                CURRENTSURFLABEL=0
                DO 5090 V=1, (SN-1)
                    IF (SURFTYPESPEC (V) .EQ. 'CZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
                        CURRENTSURFLABEL=V
                        EXIT
                    ENDIF
                ENDIF
5090          CONTINUE
                IF (CURRENTSURFLABEL .EQ. 0) THEN
                    APSRABSSURF=SN
                    SURFTYPESPEC (SN) = 'CZ'
                    SURFVALUESPEC (SN) =CURRENTSURF
                    SN=SN+1
                ELSE
                    APSRABSSURF=CURRENTSURFLABEL
                ENDIF
*   Define the APSR cladding inner radius.
                CURRENTSURF=APSRADIM (BANKNUM (COLUMN,ROW) ,2)
                CURRENTSURFLABEL=0
                DO 5100 V=1, (SN-1)
                    IF (SURFTYPESPEC (V) .EQ. 'CZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
                        CURRENTSURFLABEL=V
                        EXIT
                    ENDIF
                ENDIF
5100          CONTINUE

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 328 of 647

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      IF (CURRENTSURFLABEL.EQ.0) THEN
        APSRCLADIRSURF=SN
        SURFTYPESPEC(SN)='CZ'
        SURFVALUESPEC(SN)=CURRENTSURF
        SN=SN+1
      ELSE
        APSRCLADIRSURF=CURRENTSURFLABEL
      ENDIF
*   Define the APSR cladding outer radius.
      CURRENTSURF=APSRADIM(BANKNUM(COLUMN,ROW),3)
      CURRENTSURFLABEL=0
      DO 5110 V=1,(SN-1)
        IF (SURFTYPESPEC(V).EQ.'CZ') THEN
          IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
            CURRENTSURFLABEL=V
            EXIT
          ENDIF
        ENDIF
5110      CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
        APSRCLADORSURF=SN
        SURFTYPESPEC(SN)='CZ'
        SURFVALUESPEC(SN)=CURRENTSURF
        SN=SN+1
      ELSE
        APSRCLADORSURF=CURRENTSURFLABEL
      ENDIF
*   Define the APSR cladding bottom surface.
      CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)+
c     APSRADIM(BANKNUM(COLUMN,ROW),6)-
c     APSRADIM(BANKNUM(COLUMN,ROW),11)-
c     APSRADIM(BANKNUM(COLUMN,ROW),9)
      IF (CURRENTSURF.GE.SURFVALUESPEC(UFTOPSURF)) THEN
        CURRENTSURF=SURFVALUESPEC(UFTOPSURF)
      ENDIF
      CURRENTSURFLABEL=0
      DO 5120 V=1,(SN-1)
        IF (SURFTYPESPEC(V).EQ.'PZ') THEN
          IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
            CURRENTSURFLABEL=V
            EXIT
          ENDIF
        ENDIF
5120      CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
        APSRCLADBOTTOMSURF=SN
        SURFTYPESPEC(SN)='PZ'
        SURFVALUESPEC(SN)=CURRENTSURF
        SN=SN+1
      ELSE
        APSRCLADBOTTOMSURF=CURRENTSURFLABEL
      ENDIF
*   Define the APSR absorber bottom surface.
      CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)+

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 329 of 647

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c      APSRADIM(BANKNUM(COLUMN,ROW),6)
      IF (CURRENTSURF.GE.SURFVALUESPEC(UFTOPSURF)) THEN
        CURRENTSURF=SURFVALUESPEC(UFTOPSURF)
      ENDIF
      CURRENTSURFLABEL=0
      DO 5140 V=1,(SN-1)
        IF (SURFTYPESPEC(V).EQ.'PZ') THEN
          IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
            CURRENTSURFLABEL=V
            EXIT
          ENDIF
        ENDIF
5140    CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
        APSRABSBOTTOMSURF=SN
        SURFTYPESPEC(SN)='PZ'
        SURFVALUESPEC(SN)=CURRENTSURF
        SN=SN+1
      ELSE
        APSRABSBOTTOMSURF=CURRENTSURFLABEL
      ENDIF
*    Define the APSR absorber top surface.
      CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)+
c      APSRADIM(BANKNUM(COLUMN,ROW),6)+
c      APSRADIM(BANKNUM(COLUMN,ROW),7)
      IF (CURRENTSURF.GE.SURFVALUESPEC(UFTOPSURF)) THEN
        CURRENTSURF=SURFVALUESPEC(UFTOPSURF)
      ENDIF
      CURRENTSURFLABEL=0
      DO 5150 V=1,(SN-1)
        IF (SURFTYPESPEC(V).EQ.'PZ') THEN
          IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
            CURRENTSURFLABEL=V
            EXIT
          ENDIF
        ENDIF
5150    CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
        APSRABSTOPSURF=SN
        SURFTYPESPEC(SN)='PZ'
        SURFVALUESPEC(SN)=CURRENTSURF
        SN=SN+1
      ELSE
        APSRABSTOPSURF=CURRENTSURFLABEL
      ENDIF
*    Define the APSR upper plenum top surface.
      CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)+
c      APSRADIM(BANKNUM(COLUMN,ROW),6)+
c      APSRADIM(BANKNUM(COLUMN,ROW),7)+
c      APSRADIM(BANKNUM(COLUMN,ROW),10)
      IF (CURRENTSURF.GE.SURFVALUESPEC(UFTOPSURF)) THEN
        CURRENTSURF=SURFVALUESPEC(UFTOPSURF)
      ENDIF
      CURRENTSURFLABEL=0

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 330 of 647

```

      DO 5160 V=1, (SN-1)
        IF (SURFTYPESPEC(V).EQ.'PZ') THEN
          IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
            CURRENTSURFLABEL=V
            EXIT
          ENDIF
        ENDIF
5160 CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
        APSRUPTOPSURF=SN
        SURFTYPESPEC(SN)='PZ'
        SURFVALUESPEC(SN)=CURRENTSURF
        SN=SN+1
      ELSE
        APSRUPTOPSURF=CURRENTSURFLABEL
      ENDIF
*   Define the APSR intermediate plug top surface.
      CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)+
c   APSRADIM(BANKNUM(COLUMN,ROW),6)+
c   APSRADIM(BANKNUM(COLUMN,ROW),7)+
c   APSRADIM(BANKNUM(COLUMN,ROW),10)+
c   APSRADIM(BANKNUM(COLUMN,ROW),8)
      IF (CURRENTSURF.GE.SURFVALUESPEC(UFTOPSURF)) THEN
        CURRENTSURF=SURFVALUESPEC(UFTOPSURF)
      ENDIF
      CURRENTSURFLABEL=0
      DO 5170 V=1, (SN-1)
        IF (SURFTYPESPEC(V).EQ.'PZ') THEN
          IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
            CURRENTSURFLABEL=V
            EXIT
          ENDIF
        ENDIF
5170 CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
        APSRIPLUGTOPSURF=SN
        SURFTYPESPEC(SN)='PZ'
        SURFVALUESPEC(SN)=CURRENTSURF
        SN=SN+1
      ELSE
        APSRIPLUGTOPSURF=CURRENTSURFLABEL
      ENDIF
      IF (SURFVALUESPEC(APSRABSBOTTOMSURF).LT.
c   SURFVALUESPEC(UFTOPSURF)) THEN
*   Check Axial Power Shaping Rod Absorber Material
      DO 5193 C=1,APSRABSMAT(BANKNUM(COLUMN,ROW),2)
        IF (C.EQ.1) THEN
          WRITE(200,5191) APSRABSMAT,
c   APSRABSZAIDS(BANKNUM(COLUMN,ROW),C),
c   (-1*APSRABSWTS(BANKNUM(COLUMN,ROW),C)),
c   ASSYID(COLUMN,ROW)
5191 FORMAT(T1,'M',I4,T9,A9,3X,G14.6;
c   '$ Axial Power Shaping Rod Absorber',
c   ' Material in Assembly ',A5)

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 331 of 647

```

                ELSE
                WRITE(200,5192)
c                APSRABSAIDS (BANKNUM(COLUMN,ROW),C),
c                (-1*APSRABSWTS (BANKNUM(COLUMN,ROW),C))
5192                FORMAT(T9,A9,3X,G14.6)
                ENDIF
5193                CONTINUE
                MN=MN+1
*                Write the APSR absorber cell in this APSR universe.
                WRITE(30,5200) LN, APSRABSMML,
c                (-1*APSRABSMAT(BANKNUM(COLUMN,ROW),1)), (-1*APSRABSSURF),
c                (-1*APSRABSTOPSURF), APSRABSBOTTOMSURF,
c                APSRAUNIV(COLUMN,ROW)
5200                FORMAT(T1,I4,T6,I4,T11,F10.6,T25,I4,1X,I4,1X,I4,
c                ' IMP:N=1 U=',I3,
c                ' $ Axial power shaping rod absorber region')
                LN=LN+1
*                Write the absorber-to-cladding gap cell in this APSR universe.
                WRITE(30,5210) LN, (-1*APSRCLADIRSURF), APSRABSSURF,
c                (-1*APSRABSTOPSURF),
c                APSRABSBOTTOMSURF, APSRAUNIV(COLUMN,ROW)
5210                FORMAT(T1,I4,T6,'0',T25,I4,1X,I4,1X,I4,1X,I4,
c                ' IMP:N=1 U=',I3,' $ Absorber-to-cladding gap')
                LN=LN+1
                ENDIF
*                Write the APSR cladding cell in this APSR universe.
*                Determine if the APSR cladding material specification has
*                previously been defined. If it has been previously defined, determine
*                the cladding material specification label.
                CLADMLUNIQUE=.TRUE.
                LEAVE=.FALSE.
                IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
                DO 5230 RO=1,(ROW-1)
                DO 5220 CO=1,50
                IF (BANKNUM(CO,RO).NE.0) THEN
                IF (BANKDES(BANKNUM(CO,RO)).EQ.'APSRA') THEN
                IF (APSRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.
c                APSRCLADMAT(BANKNUM(CO,RO))) THEN
                CLADMLUNIQUE=.FALSE.
                LEAVE=.TRUE.
                APSRCLADML(COLUMN,ROW)=APSRCLADML(CO,RO)
                EXIT
                ENDIF
                ENDIF
                ENDIF
5220                CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                EXIT
                ENDIF
5230                CONTINUE
                IF (LEAVE.EQ..FALSE.) THEN
                DO 5250 RO=ROW,ROW
                DO 5240 CO=1,(COLUMN-1)
                IF (BANKNUM(CO,RO).NE.0) THEN

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 332 of 647

```

      IF (BANKDES(BANKNUM(CO,RO)).EQ.'APSRA') THEN
      IF (APSRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.
c      APSRCLADMAT(BANKNUM(CO,RO))) THEN
          CLADMLUNIQUE=.FALSE.
          LEAVE=.TRUE.
          APSRCLADML(COLUMN,ROW)=APSRCLADML(CO,RO)
          EXIT
      ENDIF
      ENDIF
      ENDIF
5240      CONTINUE
      IF (LEAVE.EQ..TRUE.) THEN
          EXIT
      ENDIF
5250      CONTINUE
      ENDIF
      ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
          DO 5270 RO=1,(ROW-1)
          DO 5260 CO=1,50
              IF (BANKNUM(CO,RO).NE.0) THEN
              IF (BANKDES(BANKNUM(CO,RO)).EQ.'APSRA') THEN
              IF (APSRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.
c              APSRCLADMAT(BANKNUM(CO,RO))) THEN
                  CLADMLUNIQUE=.FALSE.
                  LEAVE=.TRUE.
                  APSRCLADML(COLUMN,ROW)=APSRCLADML(CO,RO)
                  EXIT
              ENDIF
              ENDIF
              ENDIF
5260      CONTINUE
              IF (LEAVE.EQ..TRUE.) THEN
                  EXIT
              ENDIF
5270      CONTINUE
              ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
                  DO 5290 RO=1,1
                  DO 5280 CO=1,(COLUMN-1)
                      IF (BANKNUM(CO,RO).NE.0) THEN
                      IF (BANKDES(BANKNUM(CO,RO)).EQ.'APSRA') THEN
                      IF (APSRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.
c                      APSRCLADMAT(BANKNUM(CO,RO))) THEN
                          CLADMLUNIQUE=.FALSE.
                          LEAVE=.TRUE.
                          APSRCLADML(COLUMN,ROW)=APSRCLADML(CO,RO)
                          EXIT
                      ENDIF
                      ENDIF
                      ENDIF
5280      CONTINUE
                          IF (LEAVE.EQ..TRUE.) THEN
                              EXIT
                          ENDIF
5290      CONTINUE
                          CONTINUE
```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 333 of 647

```
      ENDIF
      IF (SURFVALUESPEC (APSRCLADBOTTOMSURF) .LT.
c      SURFVALUESPEC (UEFTOPSURF)) THEN
      IF (CLADMLUNIQUE.EQ..TRUE.) THEN
      APSRCLADML (COLUMN, ROW) = MN
* Check Axial Power Shaping Rod Cladding
      IF (APSRCLADMAT (BANKNUM (COLUMN, ROW)) .EQ. 1) THEN
      DO 5292 C=1,2
      IF (C.EQ.1) THEN
      WRITE (200,9300) APSRCLADML (COLUMN, ROW)
      ELSEIF (C.EQ.2) THEN
      WRITE (200,9301)
      WRITE (200,7000)
      WRITE (200,7001)
      WRITE (200,7002)
      WRITE (200,9302)
      WRITE (200,7003)
      WRITE (200,7004)
      WRITE (200,7005)
      WRITE (200,9303)
      WRITE (200,9304)
      ENDIF
5292 CONTINUE
      ELSEIF (APSRCLADMAT (BANKNUM (COLUMN, ROW))
c      .EQ.2) THEN
      DO 5294 C=1,2
      IF (C.EQ.1) THEN
      WRITE (200,9305) APSRCLADML (COLUMN, ROW)
      ELSEIF (C.EQ.2) THEN
      WRITE (200,9306)
      WRITE (200,9307)
      WRITE (200,9308)
      WRITE (200,9309)
      WRITE (200,9310)
      WRITE (200,7006)
      WRITE (200,7007)
      WRITE (200,7008)
      WRITE (200,9311)
      WRITE (200,9312)
      WRITE (200,7009)
      WRITE (200,7010)
      WRITE (200,7011)
      WRITE (200,9313)
      WRITE (200,7012)
      WRITE (200,7013)
      WRITE (200,7014)
      WRITE (200,7015)
      ENDIF
5294 CONTINUE
      ELSEIF (APSRCLADMAT (BANKNUM (COLUMN, ROW))
c      .EQ.3) THEN
      DO 5296 C=1,2
      IF (C.EQ.1) THEN
      WRITE (200,9314) APSRCLADML (COLUMN, ROW)
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 334 of 647

```

ELSEIF (C.EQ.2) THEN
  WRITE(200,9315)
  WRITE(200,9316)
  WRITE(200,9317)
  WRITE(200,9318)
  WRITE(200,7016)
  WRITE(200,7017)
  WRITE(200,7018)
  WRITE(200,9319)
  WRITE(200,9320)
  WRITE(200,7019)
  WRITE(200,7020)
  WRITE(200,7021)
  WRITE(200,9321)
  WRITE(200,7022)
  WRITE(200,7023)
  WRITE(200,7024)
  WRITE(200,7025)
  WRITE(200,9322)
  WRITE(200,9323)
  WRITE(200,9324)
  WRITE(200,9325)
  WRITE(200,9326)
  WRITE(200,9327)
  WRITE(200,7026)
  WRITE(200,9328)
  WRITE(200,9329)
  WRITE(200,9330)
ENDIF
5296      CONTINUE
      ENDIF
      MN=MN+1
ENDIF
IF (APSRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.1) THEN
  CLADRHO=6.56
ELSEIF (APSRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.2) THEN
  CLADRHO=7.90
ELSEIF (APSRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.3) THEN
  CLADRHO=8.19
ENDIF
WRITE(30,5308) LN, APSRCLADML(COLUMN,ROW), (-1*CLADRHO),
c APSRCLADIRSURF,
c (-1*APSRCLADORSURF), (-1*APSRCLADTOPSURF),
c APSRCLADBOTMSURF, APSRAUNIV(COLUMN,ROW)
5308  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
c ' IMP:N=1 U=',I3,
c ' $ Axial power shaping rod cladding')
LN=LN+1
ENDIF
* Write the APSR upper plenum cell in this APSR universe.
* Determine if the APSR upper plenum material specification has
* previously been defined. If it has been previously defined, determine
* the upper plenum material specification label.
APSRUPMLUNIQUE=.TRUE.

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 335 of 647

```
LEAVE=.FALSE.
IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
  DO 5320 RO=1,(ROW-1)
    DO 5310 CO=1,50
      IF (BANKNUM(CO,RO).NE.0) THEN
        IF (BANKNUM(COLUMN,ROW).EQ.
          BANKNUM(CO,RO)) THEN
          APSRUPMLUNIQUE=.FALSE.
          LEAVE=.TRUE.
          APSRUPML(COLUMN,ROW)=APSRUPML(CO,RO)
          EXIT
        ENDIF
      ENDIF
    CONTINUE
  5310 IF (LEAVE.EQ..TRUE.) THEN
    EXIT
  ENDIF
  5320 CONTINUE
  IF (LEAVE.EQ..FALSE.) THEN
    DO 5340 RO=ROW,ROW
      DO 5330 CO=1,(COLUMN-1)
        IF (BANKNUM(CO,RO).NE.0) THEN
          IF (BANKNUM(COLUMN,ROW).EQ.
            BANKNUM(CO,RO)) THEN
            APSRUPMLUNIQUE=.FALSE.
            LEAVE=.TRUE.
            APSRUPML(COLUMN,ROW)=APSRUPML(CO,RO)
            EXIT
          ENDIF
        ENDIF
      CONTINUE
    5330 IF (LEAVE.EQ..TRUE.) THEN
      EXIT
    ENDIF
    5340 CONTINUE
  ENDIF
  ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
    DO 5360 RO=1,(ROW-1)
      DO 5350 CO=1,50
        IF (BANKNUM(CO,RO).NE.0) THEN
          IF (BANKNUM(COLUMN,ROW).EQ.
            BANKNUM(CO,RO)) THEN
            APSRUPMLUNIQUE=.FALSE.
            LEAVE=.TRUE.
            APSRUPML(COLUMN,ROW)=APSRUPML(CO,RO)
            EXIT
          ENDIF
        ENDIF
      CONTINUE
    5350 IF (LEAVE.EQ..TRUE.) THEN
      EXIT
    ENDIF
    5360 CONTINUE
  ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 336 of 647

```

DO 5380 RO=1,1
DO 5370 CO=1, (COLUMN-1)
  IF (BANKNUM(CO,RO).NE.0) THEN
    IF (BANKNUM(COLUMN,ROW).EQ.
      BANKNUM(CO,RO)) THEN
      APSRUPMLUNIQUE=.FALSE.
      LEAVE=.TRUE.
      APSRUPML(COLUMN,ROW)=APSRUPML(CO,RO)
      EXIT
    ENDIF
  ENDIF
5370 CONTINUE
  IF (LEAVE.EQ..TRUE.) THEN
    EXIT
  ENDIF
5380 CONTINUE
  ENDIF
  IF (SURFVALUESPEC(APSRABSTOPSURF).LT.
    SURFVALUESPEC(UEFTOPSURF)) THEN
    IF (APSRUPMLUNIQUE.EQ..TRUE.) THEN
      APSRUPML(COLUMN,ROW)=MN
* Check Axial Power Shaping Rod Upper Plenum Regions
      DO 5383 C=1,APSRUPLNMAT(BANKNUM(COLUMN,ROW),2)
        IF (C.EQ.1) THEN
          WRITE(200,5381) APSRUPML(COLUMN,ROW),
            APSRUPLNZAIDS(BANKNUM(COLUMN,ROW),C),
            (-1*APSRUPLNWT(S(BANKNUM(COLUMN,ROW),C)))
          5381 FORMAT(T1,'M',I4,T9,A9,3X,G14.6,
            '$ Axial Power Shaping Rod Upper Plenum')
        ELSE
          WRITE(200,5382)
            APSRUPLNZAIDS(BANKNUM(COLUMN,ROW),C);
            (-1*APSRUPLNWT(S(BANKNUM(COLUMN,ROW),C)))
          5382 FORMAT(T9,A9,3X,G14.6)
        ENDIF
      5383 CONTINUE
      MN=MN+1
    ENDIF
    WRITE(30,5390) LN, APSRUPML(COLUMN,ROW),
      (-1*APSRUPLNMAT(BANKNUM(COLUMN,ROW),1)),
      APSRABSTOPSURF,
      (-1*APSRUPTOPSURF), (-1*APSRCLADIRSURF),
      APSRAUNIV(COLUMN,ROW)
    5390 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
      ' IMP:N=1 U=',I3,
      '$ Axial power shaping rod upper plenum')
    LN=LN+1
  ENDIF
* Write the APSR lower plenum cell in this APSR universe.
* Determine if the APSR lower plenum material specification has
* previously been defined. If it has been previously defined, determine
* the lower plenum material specification label.
  IF (APSRADIM(BANKNUM(COLUMN,ROW),11).GT.(0.0)) THEN
    APSRLPMLUNIQUE=.TRUE.

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 337 of 647

```
LEAVE= .FALSE.
IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
  DO 5410 RO=1, (ROW-1)
    DO 5400 CO=1,50
      IF (BANKNUM(CO,RO).NE.0) THEN
        IF (BANKNUM(COLUMN,ROW).EQ.
          BANKNUM(CO,RO)) THEN
          APSRLPMLUNIQUE=.FALSE.
          LEAVE=.TRUE.
          APSRLPML(COLUMN,ROW)=APSRLPML(CO,RO)
          EXIT
        ENDIF
      ENDIF
    CONTINUE
  5400 IF (LEAVE.EQ..TRUE.) THEN
    EXIT
  ENDIF
  5410 CONTINUE
  IF (LEAVE.EQ..FALSE.) THEN
    DO 5430 RO=ROW,ROW
      DO 5420 CO=1, (COLUMN-1)
        IF (BANKNUM(CO,RO).NE.0) THEN
          IF (BANKNUM(COLUMN,ROW).EQ.
            BANKNUM(CO,RO)) THEN
            APSRLPMLUNIQUE=.FALSE.
            LEAVE=.TRUE.
            APSRLPML(COLUMN,ROW)=APSRLPML(CO,RO)
            EXIT
          ENDIF
        ENDIF
      CONTINUE
    5420 IF (LEAVE.EQ..TRUE.) THEN
      EXIT
    ENDIF
    5430 CONTINUE
  ENDIF
  ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
    DO 5450 RO=1, (ROW-1)
      DO 5440 CO=1,50
        IF (BANKNUM(CO,RO).NE.0) THEN
          IF (BANKNUM(COLUMN,ROW).EQ.
            BANKNUM(CO,RO)) THEN
            APSRLPMLUNIQUE=.FALSE.
            LEAVE=.TRUE.
            APSRLPML(COLUMN,ROW)=APSRLPML(CO,RO)
            EXIT
          ENDIF
        ENDIF
      CONTINUE
    5440 IF (LEAVE.EQ..TRUE.) THEN
      EXIT
    ENDIF
    5450 CONTINUE
  ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 338 of 647

```

DO 5470 RO=1,1
DO 5460 CO=1, (COLUMN-1)
  IF (BANKNUM(CO,RO).NE.0) THEN
    IF (BANKNUM(COLUMN,ROW).EQ.
      BANKNUM(CO,RO)) THEN
      APSRLPMLUNIQUE=.FALSE.
      LEAVE=.TRUE.
      APSRLPML(COLUMN,ROW)=APSRLPML(CO,RO)
      EXIT
    ENDIF
  ENDIF
5460 CONTINUE
  IF (LEAVE.EQ..TRUE.) THEN
    EXIT
  ENDIF
5470 CONTINUE
ENDIF
IF (SURFVALUESPEC(APSRLADBOTTOMSURF).LT.
  SURFVALUESPEC(UEFTOPSURF)) THEN
  IF (APSRLPMLUNIQUE.EQ..TRUE.) THEN
    APSRLPML(COLUMN,ROW)=MN
* Check Axial Power Shaping Rod Lower Plenum Regions
DO 5473 C=1,APSRLPLENMAT(BANKNUM(COLUMN,ROW),2)
  IF (C.EQ.1) THEN
    WRITE(200,5471) APSRLPML(COLUMN,ROW),
      APSRLPLENZAIDS(BANKNUM(COLUMN,ROW),C),
      (-1*APSRLPLENWT(S(BANKNUM(COLUMN,ROW),C))
5471 FORMAT(T1,'M',I4,T9,A9,3X,G14.6,
      '$ Axial Power Shaping Rod Lower Plenum')
    ELSE
    WRITE(200,5472)
    APSRLPLENZAIDS(BANKNUM(COLUMN,ROW),C),
    (-1*APSRLPLENWT(S(BANKNUM(COLUMN,ROW),C))
5472 FORMAT(T9,A9,3X,G14.6)
  ENDIF
5473 CONTINUE
  MN=MN+1
ENDIF
WRITE(30,5480) LN, APSRLPML(COLUMN,ROW),
  (-1*APSRLPLENMAT(BANKNUM(COLUMN,ROW),1)),
  APSRLADBOTTOMSURF,
  (-1*APSRABSBOTTOMSURF), (-1*APSRCLADIRSURF),
  APSRAUNIV(COLUMN,ROW)
5480 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
  ' IMP:N=1 U=',I3,
  '$ Axial power shaping rod lower plenum')
  LN=LN+1
ENDIF
ENDIF
IF (SURFVALUESPEC(APSRLTOPSURF).LT.
  SURFVALUESPEC(UEFTOPSURF)) THEN
* Calculate the APSR intermediate plug cell density.
  APSRIPLUGML(COLUMN,ROW)=MN
  IF (APSRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.1) THEN

```

Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 339 of 647

```

      APSRIPLUGDEN (BANKNUM (COLUMN, ROW) ) =
c      ( (APSRIPLUGFRAC (BANKNUM (COLUMN, ROW) ) * 6.56) +
c      ( (1.0 - APSRIPLUGFRAC (BANKNUM (COLUMN, ROW) ) ) *
c      MODDENSITY) )
      SPACMASS = APSRIPLUGFRAC (BANKNUM (COLUMN, ROW) ) * 6.56
      MODMASS = (1.0 - APSRIPLUGFRAC (BANKNUM (COLUMN, ROW) ) ) *
c      MODDENSITY
      SPACFRAC = SPACMASS / (SPACMASS + MODMASS)
      MODFRAC = MODMASS / (SPACMASS + MODMASS)
      BWTINH2O = ( (PPMB * 1E-6) / (1.0 + (PPMB * 1E-6) ) ) * 100.0
      HWTINH2O = ( (1.008664904 * 0.999167 * 2.0) /
c      ( (1.008664904 * 0.999167 * 2.0) +
c      (1.008664904 * 15.857510) ) ) * (100.0 - BWTINH2O)
      OWTINH2O = ( (1.008664904 * 15.857510) /
c      ( (1.008664904 * 0.999167 * 2.0) +
c      (1.008664904 * 15.857510) ) ) * (100.0 - BWTINH2O)
      B10WTINH2O = ( (1.008664904 * 9.926922 * 0.194) /
c      ( (1.008664904 * 9.926922 * 0.194) +
c      (1.008664904 * 10.914730 * 0.806) ) ) * BWTINH2O
      B11WTINH2O = ( (1.008664904 * 10.914730 * 0.806) /
c      ( (1.008664904 * 9.926922 * 0.194) +
c      (1.008664904 * 10.914730 * 0.806) ) ) * BWTINH2O
      OWT = (OWTINH2O * MODFRAC) + (0.120 * SPACFRAC)
      HWT = HWTINH2O * MODFRAC
      B10WT = (B10WTINH2O * MODFRAC)
      B11WT = (B11WTINH2O * MODFRAC)
      CRWT = 0.100 * SPACFRAC
      CR50 = 0.04173684
      CR52 = 0.837
      CR53 = 0.09673684
      CR54 = 0.02452632
      FEWT = 0.200 * SPACFRAC
      FE54 = 0.05699324
      FE56 = 0.91868499
      FE57 = 0.02141247
      FE58 = 0.00290930
      ZRWT = 98.180 * SPACFRAC
      SNWT = 1.400 * SPACFRAC
c      WRITE (200, 5491) APSRIPLUGML (COLUMN, ROW) ,
c      (-1 * HWT) , ASSYID (COLUMN, ROW)
5491      FORMAT (T1, 'M', I4, T9, ' 1001.50c'3X, G14.8,
c      ' $ APSR Intermediate Zirc-4 Plug in Assembly ', A5)
      WRITE (200, 5492) -1 * OWT
5492      FORMAT (T9, ' 8016.50c', 3X, G14.8)
      WRITE (200, 5493) -1 * B10WT
5493      FORMAT (T9, ' 5010.50c', 3X, G14.8)
      WRITE (200, 5494) -1 * B11WT
5494      FORMAT (T9, ' 5011.56c', 3X, G14.8)
      WRITE (200, 5495) -1 * CRWT * CR50
5495      FORMAT (T9, '24050.60c', 3X, G14.8)
      WRITE (200, 7077) -1 * CRWT * CR52
7077      FORMAT (T9, '24052.60c', 3X, G14.8)
      WRITE (200, 7078) -1 * CRWT * CR53
7078      FORMAT (T9, '24053.60c', 3X, G14.8)
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 340 of 647

```

7079      WRITE(200,7079) -1*CRWT*CR54
          FORMAT(T9,'24054.60c',3X,G14.8)
5499      WRITE(200,5499) -1*FEWT*FE54
          FORMAT(T9,'26054.60c',3X,G14.8)
7080      WRITE(200,7080) -1*FEWT*FE56
          FORMAT(T9,'26056.60c',3X,G14.8)
7081      WRITE(200,7081) -1*FEWT*FE57
          FORMAT(T9,'26057.60c',3X,G14.8)
7082      WRITE(200,7082) -1*FEWT*FE58
          FORMAT(T9,'26058.60c',3X,G14.8)
5503      WRITE(200,5503) -1*ZRWT
          FORMAT(T9,'40093.50c',3X,G14.8)
5504      WRITE(200,5504) -1*SNWT
          FORMAT(T9,'50000.35c',3X,G14.8)
          ELSEIF (APSRCLDMAT(BANKNUM(COLUMN,ROW)).EQ.2) THEN
          APSRIPLUGDEN(BANKNUM(COLUMN,ROW))=
c          ((APSRIPUGFRAC(BANKNUM(COLUMN,ROW))*7.9)+
c          ((1.0-APSRIPUGFRAC(BANKNUM(COLUMN,ROW)))*
c          MODDENSITY))
          SPACMASS=APSRIPUGFRAC(BANKNUM(COLUMN,ROW))*7.9
          MODMASS=(1.0-APSRIPUGFRAC(BANKNUM(COLUMN,ROW)))*
c          MODDENSITY
          SPACFRAC=SPACMASS/(SPACMASS+MODMASS)
          MODFRAC=MODMASS/(SPACMASS+MODMASS)
          BWTINH2O=((PPMB*1E-6)/(1.0+(PPMB*1E-6)))*100.0
          HWTINH2O=((1.008664904*0.999167*2.0)/
c          ((1.008664904*0.999167*2.0)+
c          (1.008664904*15.857510)))*(100.0-BWTINH2O)
          OWTINH2O=((1.008664904*15.857510)/
c          ((1.008664904*0.999167*2.0)+
c          (1.008664904*15.857510)))*(100.0-BWTINH2O)
          B10WTINH2O=((1.008664904*9.926922*0.194)/
c          ((1.008664904*9.926922*0.194)+
c          (1.008664904*10.914730*0.806)))*BWTINH2O
          B11WTINH2O=((1.008664904*10.914730*0.806)/
c          ((1.008664904*9.926922*0.194)+
c          (1.008664904*10.914730*0.806)))*BWTINH2O
          OWT=OWTINH2O*MODFRAC
          HWT=HWTINH2O*MODFRAC
          B10WT=B10WTINH2O*MODFRAC
          B11WT=B11WTINH2O*MODFRAC
          CWT=0.08*SPACFRAC
          NWT=0.100*SPACFRAC
          SIWT=0.75*SPACFRAC
          PWT=0.045*SPACFRAC
          SWT=0.030*SPACFRAC
          CRWT=19.000*SPACFRAC
          CR50=0.04173684
          CR52=0.837
          CR53=0.09673684
          CR54=0.02452632
          MNWT=2.000*SPACFRAC
          FEWT=68.745*SPACFRAC
          FE54=0.05699324

```


Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 341 of 647

```
FE56=0.91868499
FE57=0.02141247
FE58=0.00290930
NIWT=9.250*SPACFRAC
NI58=0.67394595
NI60=0.26648649
NI61=0.01178378
NI62=0.03783784
NI64=0.00994594
WRITE(200,5505) APSRIPLUGML(COLUMN,ROW),
c      (-1*HWT), ASSYID(COLUMN,ROW)
5505   FORMAT(T1,'M',I4,T9,' 1001.50c'3X,G14.8,
c      ' $ APSR Intermediate SS304 Plug in Assembly ',A5)
WRITE(200,5506) -1*OWT
5506   FORMAT(T9,' 8016.50c',3X,G14.8)
WRITE(200,5507) -1*B10WT
5507   FORMAT(T9,' 5010.50c',3X,G14.8)
WRITE(200,5508) -1*B11WT
5508   FORMAT(T9,' 5011.56c',3X,G14.8)
WRITE(200,5509) -1*CWT
5509   FORMAT(T9,'6000.50c',3X,G14.8)
WRITE(200,5510) -1*NWT
5510   FORMAT(T9,'7014.50c',3X,G14.8)
WRITE(200,5511) -1*SIWT
5511   FORMAT(T9,'14000.50c',3X,G14.8)
WRITE(200,5512) -1*PWT
5512   FORMAT(T9,'15031.50c',3X,G14.8)
WRITE(200,5513) -1*SWT
5513   FORMAT(T9,'16032.50c',3X,G14.8)
WRITE(200,5514) -1*CRWT*CR50
5514   FORMAT(T9,'24050.60c',3X,G14.8)
WRITE(200,7084) -1*CRWT*CR52
7084   FORMAT(T9,'24052.60c',3X,G14.8)
WRITE(200,7085) -1*CRWT*CR53
7085   FORMAT(T9,'24053.60c',3X,G14.8)
WRITE(200,7086) -1*CRWT*CR54
7086   FORMAT(T9,'24054.60c',3X,G14.8)
WRITE(200,5518) -1*MNWT
5518   FORMAT(T9,'25055.50c',3X,G14.8)
WRITE(200,5519) -1*FEWT*FE54
5519   FORMAT(T9,'26054.60c',3X,G14.8)
WRITE(200,7087) -1*FEWT*FE56
7087   FORMAT(T9,'26056.60c',3X,G14.8)
WRITE(200,7088) -1*FEWT*FE57
7088   FORMAT(T9,'26057.60c',3X,G14.8)
WRITE(200,7089) -1*FEWT*FE58
7089   FORMAT(T9,'26058.60c',3X,G14.8)
WRITE(200,5523) -1*NIWT*NI58
5523   FORMAT(T9,'28058.60c',3X,G14.8)
WRITE(200,7090) -1*NIWT*NI60
7090   FORMAT(T9,'28060.60c',3X,G14.8)
WRITE(200,7091) -1*NIWT*NI61
7091   FORMAT(T9,'28061.60c',3X,G14.8)
WRITE(200,7092) -1*NIWT*NI62
```

Waste Package Operations

Engineering Calculation

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 342 of 647

```
7092      FORMAT(T9, '28062.60c', 3X, G14.8)
          WRITE(200, 7093) -1*NIWT*NI64
7093      FORMAT(T9, '28064.60c', 3X, G14.8)
          ELSEIF (APSRCLADMAT(BANKNUM(COLUMN, ROW)).EQ.3) THEN
          APSRIPLUGDEN(BANKNUM(COLUMN, ROW)) =
c          ((APSRIPUGFRAC(BANKNUM(COLUMN, ROW))*8.19)+
c          ((1.0-APSRIPUGFRAC(BANKNUM(COLUMN, ROW)))*
c          MODDENSITY))
          SPACMASS=APSRIPUGFRAC(BANKNUM(COLUMN, ROW))*8.19
          MODMASS=(1.0-APSRIPUGFRAC(BANKNUM(COLUMN, ROW)))*
c          MODDENSITY
          SPACFRAC=SPACMASS/(SPACMASS+MODMASS)
          MODFRAC=MODMASS/(SPACMASS+MODMASS)
          BWTINH2O=((PPMB*1E-6)/(1.0+(PPMB*1E-6)))*100.0
          HWTINH2O=((1.008664904*0.999167*2.0)/
c          ((1.008664904*0.999167*2.0)+
c          (1.008664904*15.857510)))*(100.0-BWTINH2O)
          OWTINH2O=((1.008664904*15.857510)/
c          ((1.008664904*0.999167*2.0)+
c          (1.008664904*15.857510)))*(100.0-BWTINH2O)
          B10WTINH2O=((1.008664904*9.926922*0.194)/
c          ((1.008664904*9.926922*0.194)+
c          (1.008664904*10.914730*0.806)))*BWTINH2O
          B11WTINH2O=((1.008664904*10.914730*0.806)/
c          ((1.008664904*9.926922*0.194)+
c          (1.008664904*10.914730*0.806)))*BWTINH2O
          B10WTINB=((1.008664904*9.926922*0.194)/
c          ((1.008664904*9.926922*0.194)+
c          (1.008664904*10.914730*0.806)))*100.0
          B11WTINB=((1.008664904*10.914730*0.806)/
c          ((1.008664904*9.926922*0.194)+
c          (1.008664904*10.914730*0.806)))*100.0
          OWT=OWTINH2O*MODFRAC
          HWT=HWTINH2O*MODFRAC
          B10WT=(B10WTINH2O*MODFRAC)+(B10WTINB*0.006*SPACFRAC)
          B11WT=(B11WTINH2O*MODFRAC)+(B11WTINB*0.006*SPACFRAC)
          CWT=0.080*SPACFRAC
          SIWT=0.350*SPACFRAC
          PWT=0.015*SPACFRAC
          SWT=0.015*SPACFRAC
          CRWT=19.000*SPACFRAC
          CR50=0.04173684
          CR52=0.837
          CR53=0.09673684
          CR54=0.02452632
          FE54=0.05699324
          FE56=0.91868499
          FE57=0.02141247
          FE58=0.00290930
          NI58=0.67394595
          NI60=0.26648649
          NI61=0.01178378
          NI62=0.03783784
          NI64=0.00994594
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 343 of 647

```
CU63=0.683
CU65=0.317
MNWT=0.350*SPACFRAC
FEWT=16.809*SPACFRAC
NIWT=52.500*SPACFRAC
ALWT=0.500*SPACFRAC
TIWT=0.900*SPACFRAC
COWT=1.000*SPACFRAC
CUWT=0.300*SPACFRAC
NBWT=2.563*SPACFRAC
MOWT=3.050*SPACFRAC
TAWT=2.563*SPACFRAC
WRITE(200,5528) APSRIPLUGML(COLUMN,ROW),
(-1*HWT), ASSYID(COLUMN,ROW)
c
5528  FORMAT(T1,'M',I4,T9,' 1001.50c',3X,G14.8,
c      '$ APSR Intermediate Inconel Plug in Assembly ',A5)
WRITE(200,5529) -1*OWT
5529  FORMAT(T9,' 8016.50c',3X,G14.8)
WRITE(200,5530) -1*B1OWT
5530  FORMAT(T9,' 5010.50c',3X,G14.8)
WRITE(200,5531) -1*B11WT
5531  FORMAT(T9,' 5011.56c',3X,G14.8)
WRITE(200,5532) -1*CWT
5532  FORMAT(T9,'6000.50c',3X,G14.8)
WRITE(200,5533) -1*SIWT
5533  FORMAT(T9,'14000.50c',3X,G14.8)
WRITE(200,5534) -1*PWT
5534  FORMAT(T9,'15031.50c',3X,G14.8)
WRITE(200,5535) -1*SWT
5535  FORMAT(T9,'16032.50c',3X,G14.8)
WRITE(200,5536) -1*CRWT*CR50
5536  FORMAT(T9,'24050.60c',3X,G14.8)
WRITE(200,7094) -1*CRWT*CR52
7094  FORMAT(T9,'24052.60c',3X,G14.8)
WRITE(200,7095) -1*CRWT*CR53
7095  FORMAT(T9,'24053.60c',3X,G14.8)
WRITE(200,7096) -1*CRWT*CR54
7096  FORMAT(T9,'24054.60c',3X,G14.8)
WRITE(200,5540) -1*MNWT
5540  FORMAT(T9,'25055.50c',3X,G14.8)
WRITE(200,5541) -1*FEWT*FE54
5541  FORMAT(T9,'26054.60c',3X,G14.8)
WRITE(200,7097) -1*FEWT*FE56
7097  FORMAT(T9,'26056.60c',3X,G14.8)
WRITE(200,7098) -1*FEWT*FE57
7098  FORMAT(T9,'26057.60c',3X,G14.8)
WRITE(200,7099) -1*FEWT*FE58
7099  FORMAT(T9,'26058.60c',3X,G14.8)
WRITE(200,5545) -1*NIWT*NI58
5545  FORMAT(T9,'28058.60c',3X,G14.8)
WRITE(200,7100) -1*NIWT*NI60
7100  FORMAT(T9,'28060.60c',3X,G14.8)
WRITE(200,7101) -1*NIWT*NI61
7101  FORMAT(T9,'28061.60c',3X,G14.8)
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 344 of 647

```

7102      WRITE(200,7102) -1*NIWT*NI62
          FORMAT(T9,'28062.60c',3X,G14.8)
7103      WRITE(200,7103) -1*NIWT*NI64
          FORMAT(T9,'28064.60c',3X,G14.8)
5550      WRITE(200,5550) -1*ALWT
          FORMAT(T9,'13027.50c',3X,G14.8)
5551      WRITE(200,5551) -1*TIWT
          FORMAT(T9,'22000.50c',3X,G14.8)
5552      WRITE(200,5552) -1*COWT
          FORMAT(T9,'27059.50c',3X,G14.8)
5553      WRITE(200,5553) -1*CUWT*CU63
          FORMAT(T9,'29063.60c',3X,G14.8)
7104      WRITE(200,7104) -1*CUWT*CU65
          FORMAT(T9,'29065.60c',3X,G14.8)
5555      WRITE(200,5555) -1*NBWT
          FORMAT(T9,'41093.50c',3X,G14.8)
5556      WRITE(200,5556) -1*MOWT
          FORMAT(T9,'42000.50c',3X,G14.8)
5557      WRITE(200,5557) -1*TAWT
          FORMAT(T9,'73181.50c',3X,G14.8)
          ENDIF
          WRITE(200,5558) APSRIPLUGML(COLUMN,ROW)
5558      FORMAT(T1,'MT',I4,T9,'LWTR.03T')
          MN=MN+1
*      Write the APSR intermediate plug cell in this APSR universe.
          WRITE(30,5559) LN, APSRIPLUGML(COLUMN,ROW),
          C      (-1*APSRIPLUGDEN(BANKNUM(COLUMN,ROW))),
          C      APSRUPTOPSURF,
          C      (-1*APSRIPLUGTOPSURF), (-1*APSRCLADIRSURF),
          C      APSRAUNIV(COLUMN,ROW)
5559      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
          C      ' IMP:N=1 U=',I3,
          C      ' $ Axial power shaping rod intermediate plug region')
          LN=LN+1
          ENDIF
          IF (SURFVALUESPEC(APSRIPLUGTOPSURF).LT.
          C      SURFVALUESPEC(UFTOPSURF)) THEN
*      Write the water above the intermediate plug cell in this APSR universe.
          WRITE(30,5560) LN, BMODML,
          C      (-1*MODDENSITY), APSRIPLUGTOPSURF,
          C      (-1*APSRCLADTOPSURF), (-1*APSRCLADIRSURF),
          C      APSRAUNIV(COLUMN,ROW)
5560      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
          C      ' IMP:N=1 U=',I3,' $ Borated moderator inside APSR')
          LN=LN+1
          ENDIF
*      Define the GT top surface.
          CURRENTSURF=GTDATA(DESNUM(COLUMN,ROW),3)
          IF (CURRENTSURF.GE.SURFVALUESPEC(UFTOPSURF)) THEN
              CURRENTSURF=SURFVALUESPEC(UFTOPSURF)
          ENDIF
          CURRENTSURFLABEL=0
          DO 5561 V=1,(SN-1)
              IF (SURFTYPESPEC(V).EQ.'PZ') THEN

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 345 of 647

```
      IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
        ENDIF
      ENDIF
5561  CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          GTTOPSURF=SN
          SURFTYPESPEC(SN)='PZ'
          SURFVALUESPEC(SN)=CURRENTSURF
          SN=SN+1
        ELSE
          GTTOPSURF=CURRENTSURFLABEL
        ENDIF
*   Define the GT bottom surface.
      CURRENTSURF=GTDATA(DESNUM(COLUMN,ROW),4)
      CURRENTSURFLABEL=0
      DO 5562 V=1,(SN-1)
          IF (SURFTYPESPEC(V).EQ.'PZ') THEN
            IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                CURRENTSURFLABEL=V
                EXIT
            ENDIF
          ENDIF
5562  CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          GTBOTSURF=SN
          SURFTYPESPEC(SN)='PZ'
          SURFVALUESPEC(SN)=CURRENTSURF
          SN=SN+1
        ELSE
          GTBOTSURF=CURRENTSURFLABEL
        ENDIF
*   Define the GT outer radius surface.
      CURRENTSURF=GTDATA(DESNUM(COLUMN,ROW),2)
      CURRENTSURFLABEL=0
      DO 5563 V=1,(SN-1)
          IF (SURFTYPESPEC(V).EQ.'CZ') THEN
            IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                CURRENTSURFLABEL=V
                EXIT
            ENDIF
          ENDIF
5563  CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          GTORSURF=SN
          SURFTYPESPEC(SN)='CZ'
          SURFVALUESPEC(SN)=CURRENTSURF
          SN=SN+1
        ELSE
          GTORSURF=CURRENTSURFLABEL
        ENDIF
*   Define the GT inner radius surface.
      CURRENTSURF=GTDATA(DESNUM(COLUMN,ROW),1)
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 346 of 647

```

CURRENTSURFLABEL=0
DO 5564 V=1, (SN-1)
  IF (SURFTYPESPEC(V).EQ.'CZ') THEN
IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
  CURRENTSURFLABEL=V
  EXIT
  ENDIF
ENDIF
5564 CONTINUE
IF (CURRENTSURFLABEL.EQ.0) THEN
  GTIRSURF=SN
  SURFTYPESPEC(SN)='CZ'
  SURFVALUESPEC(SN)=CURRENTSURF
  SN=SN+1
ELSE
  GTIRSURF=CURRENTSURFLABEL
ENDIF
* Define the lower end-fitting top surface.
CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
CURRENTSURFLABEL=0
DO 5565 V=1, (SN-1)
  IF (SURFTYPESPEC(V).EQ.'PZ') THEN
IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
  CURRENTSURFLABEL=V
  EXIT
  ENDIF
ENDIF
5565 CONTINUE
IF (CURRENTSURFLABEL.EQ.0) THEN
  APSRLEFTOPSURF=SN
  SURFTYPESPEC(SN)='PZ'
  SURFVALUESPEC(SN)=CURRENTSURF
  SN=SN+1
ELSE
  APSRLEFTOPSURF=CURRENTSURFLABEL
ENDIF
* Write the lower end-fitting cell specification for this APSR universe.
IF (SURFVALUESPEC(GTBOTSURF).GE.
c ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)) THEN
  WRITE(30,5650) LN, FRLEFML(COLUMN,ROW),
c (-1*LEFMAT(DESNUM(COLUMN,ROW),1)),
c (-1*APSRLEFTOPSURF), APSRAUNIV(COLUMN,ROW)
5650 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,' IMP:N=1 U=',I3,
c '$ Assembly lower end-fitting')
  LN=LN+1
ELSE
  WRITE(30,5660) LN, FRLEFML(COLUMN,ROW),
c (-1*LEFMAT(DESNUM(COLUMN,ROW),1)),
c (-1*APSRLEFTOPSURF), GTORSURF, APSRAUNIV(COLUMN,ROW)
5660 FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c ' IMP:N=1 U=',I3,' $ Assembly lower end-fitting')
  LN=LN+1
  WRITE(30,5670) LN, FRLEFML(COLUMN,ROW),
c (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*GTBOTSURF),

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 347 of 647

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c          (-1*GTORSURF), APSRAUNIV(COLUMN,ROW)
5670      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c          ' IMP:N=1 U=',I3,' $ Assembly lower end-fitting')
          LN=LN+1
        ENDIF
*      Write the upper end-fitting cell specification for this APSR universe.
        IF (SURFVALUESPEC(GTTOPSURF).LE.
c          SURFVALUESPEC(UEFBOTTOMSURF)) THEN
          WRITE(30,5760) LN, FRUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c          (-1*UEFTOPSURF), APSRCLADORSURF, APSRAUNIV(COLUMN,ROW)
5760      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
          LN=LN+1
        ELSEIF ((SURFVALUESPEC(GTTOPSURF).GT.
c          SURFVALUESPEC(UEFBOTTOMSURF)).AND.
c          (SURFVALUESPEC(GTTOPSURF).LT.
c          SURFVALUESPEC(UEFTOPSURF))) THEN
          WRITE(30,5770) LN, FRUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c          (-1*UEFTOPSURF), GTORSURF, APSRAUNIV(COLUMN,ROW)
5770      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
          LN=LN+1
          WRITE(30,5780) LN, FRUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), GTTOPSURF,
c          (-1*UEFTOPSURF), (-1*GTORSURF),
c          APSRCLADORSURF, APSRAUNIV(COLUMN,ROW)
5780      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          1X,I4,' IMP:N=1 U=',I3,
c          ' $ Assembly upper end-fitting')
          LN=LN+1
        ELSEIF (SURFVALUESPEC(GTTOPSURF).GE.
c          SURFVALUESPEC(UEFTOPSURF)) THEN
          WRITE(30,5790) LN, FRUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c          (-1*UEFTOPSURF), GTORSURF, APSRAUNIV(COLUMN,ROW)
5790      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
          LN=LN+1
        ENDIF
*      Write the GT material cell in this APSR universe.
*      Determine if the GT material specification has
*      previously been defined. If it has been previously defined, determine
*      the material specification label.
        CLADMLUNIQUE=.TRUE.
        LEAVE=.FALSE.
        IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
          DO 5810 RO=1,(ROW-1)
            DO 5800 CO=1,50
              IF (DESNUM(CO,RO).NE.0) THEN
                IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.
c          GTMAT(DESNUM(CO,RO))) THEN
                  CLADMLUNIQUE=.FALSE.

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 348 of 647

```

                LEAVE=.TRUE.
                GTML (COLUMN, ROW)=GTML (CO, RO)
                EXIT
            ENDIF
        ENDIF
5800      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
5810      CONTINUE
          IF (LEAVE.EQ..FALSE.) THEN
            DO 5830 RO=ROW,ROW
              DO 5820 CO=1, (COLUMN-1)
                IF (DESNM(CO,RO).NE.0) THEN
                  IF (GTMAT(DESNM(COLUMN,ROW)).EQ.
c          GTMAT(DESNM(CO,RO))) THEN
                    CLADMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    GTML (COLUMN, ROW)=GTML (CO, RO)
                    EXIT
                ENDIF
              ENDIF
5820      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
5830      CONTINUE
          ENDIF
          ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
            DO 5850 RO=1,(ROW-1)
              DO 5840 CO=1,50
                IF (DESNM(CO,RO).NE.0) THEN
                  IF (GTMAT(DESNM(COLUMN,ROW)).EQ.
c          GTMAT(DESNM(CO,RO))) THEN
                    CLADMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    GTML (COLUMN, ROW)=GTML (CO, RO)
                    EXIT
                ENDIF
              ENDIF
5840      CONTINUE
          IF (LEAVE.EQ..TRUE.) THEN
            EXIT
          ENDIF
5850      CONTINUE
          ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
            DO 5870 RO=1,1
              DO 5860 CO=1, (COLUMN-1)
                IF (DESNM(CO,RO).NE.0) THEN
                  IF (GTMAT(DESNM(COLUMN,ROW)).EQ.
c          GTMAT(DESNM(CO,RO))) THEN
                    CLADMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    GTML (COLUMN, ROW)=GTML (CO, RO)

```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 349 of 647

```
                EXIT
            ENDIF
        ENDIF
5860        CONTINUE
            IF (LEAVE.EQ..TRUE.) THEN
                EXIT
            ENDIF
5870        CONTINUE
        ENDIF
        IF (CLADMLUNIQUE.EQ..TRUE.) THEN
            GTML(COLUMN,ROW)=MN
* Check Guide Tube Material
            IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.1) THEN
                DO 5872 C=1,2
                    IF (C.EQ.1) THEN
                        WRITE(200,9300) GTML(COLUMN,ROW)
                    ELSEIF (C.EQ.2) THEN
                        WRITE(200,9301)
                        WRITE(200,7000)
                        WRITE(200,7001)
                        WRITE(200,7002)
                        WRITE(200,9302)
                        WRITE(200,7003)
                        WRITE(200,7004)
                        WRITE(200,7005)
                        WRITE(200,9303)
                        WRITE(200,9304)
                    ENDIF
                CONTINUE
5872        ELSEIF (GTMAT(DESNUM(COLUMN,ROW))
                .EQ.2) THEN
                    DO 5874 C=1,2
                        IF (C.EQ.1) THEN
                            WRITE(200,9305) GTML(COLUMN,ROW)
                        ELSEIF (C.EQ.2) THEN
                            WRITE(200,9306)
                            WRITE(200,9307)
                            WRITE(200,9308)
                            WRITE(200,9309)
                            WRITE(200,9310)
                            WRITE(200,7006)
                            WRITE(200,7007)
                            WRITE(200,7008)
                            WRITE(200,9311)
                            WRITE(200,9312)
                            WRITE(200,7009)
                            WRITE(200,7010)
                            WRITE(200,7011)
                            WRITE(200,9313)
                            WRITE(200,7012)
                            WRITE(200,7013)
                            WRITE(200,7014)
                            WRITE(200,7015)
                        ENDIF
                    ENDIF
                CONTINUE
            ENDIF
        ENDIF
    ENDIF

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 350 of 647

```

5874          CONTINUE
          ELSEIF (GTMAT(DESNUM(COLUMN,ROW))
c           .EQ.3) THEN
            DO 5876 C=1,2
              IF (C.EQ.1) THEN
                WRITE(200,9314) GTML(COLUMN,ROW)
              ELSEIF (C.EQ.2) THEN
                WRITE(200,9315)
                WRITE(200,9316)
                WRITE(200,9317)
                WRITE(200,9318)
                WRITE(200,7016)
                WRITE(200,7017)
                WRITE(200,7018)
                WRITE(200,9319)
                WRITE(200,9320)
                WRITE(200,7019)
                WRITE(200,7020)
                WRITE(200,7021)
                WRITE(200,9321)
                WRITE(200,7022)
                WRITE(200,7023)
                WRITE(200,7024)
                WRITE(200,7025)
                WRITE(200,9322)
                WRITE(200,9323)
                WRITE(200,9324)
                WRITE(200,9325)
                WRITE(200,9326)
                WRITE(200,9327)
                WRITE(200,7026)
                WRITE(200,9328)
                WRITE(200,9329)
                WRITE(200,9330)
              ENDIF
            CONTINUE
          ENDIF
5876          CONTINUE
          ENDIF
          MN=MN+1
          ENDIF
          IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.1) THEN
            CLADRHO=6.56
          ELSEIF (GTMAT(DESNUM(COLUMN,ROW)).EQ.2) THEN
            CLADRHO=7.90
          ELSEIF (GTMAT(DESNUM(COLUMN,ROW)).EQ.3) THEN
            CLADRHO=8.19
          ENDIF
          WRITE(30,5888) LN, GTML(COLUMN,ROW), (-1*CLADRHO),
c          GTIRSURF,
c          (-1*GTORSURF), (-1*GTTOPSURF), GTBOTSURF,
c          APSRAUNIV(COLUMN,ROW)
5888          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I3,' $ Guide tube region')
          LN=LN+1
*          Write the moderator cells within the GT in this APSR universe.

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 351 of 647

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        WRITE(30,5890) LN, BMODML, (-1*MODDENSITY),
c      (-1*GTIRSURF),
c      APSRCLADORSURF, (-1*GTTOPSURF), GTBOTSURF,
c      APSRAUNIV(COLUMN,ROW)
5890   FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,
c      ' $ Borated moderator inside guide tube')
        LN=LN+1
        WRITE(30,5900) LN, BMODML, (-1*MODDENSITY),
c      (-1*APSRCLADORSURF), (-1*APSRCLADBOTTOMSURF), GTBOTSURF,
c      APSRAUNIV(COLUMN,ROW)
5900   FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,
c      ' $ Borated moderator inside guide tube')
        LN=LN+1
*     Loop through the regions above the APSR (i.e. the appropriate upper
core regions)
*     Define the upper region lower surface.
        DO 6050 REGION=1,NUMREGABOVEAPSRA
*     Determine the current upper region's lower surface specification.
        IF (REGION.EQ.1) THEN
            REGIONTOPSURF=SYSTEMTOP
            CURRENTSURF=SURFVALUESPEC(SYSTEMTOP)-
c          REGABOVEAPSRA(REGION,1)
            ENDIF
            CURRENTSURF=SURFVALUESPEC(REGIONTOPSURF)-
c          REGABOVEAPSRA(REGION,1)
            IF (REGION.EQ.NUMREGABOVEAPSRA) THEN
                REGIONBOTTOMSURF=UEFTOPSURF
            ELSE
                CURRENTSURFLABEL=0
                DO 5910 V=1,(SN-1)
                    IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
            ENDIF
5910   CONTINUE
            IF (CURRENTSURFLABEL.EQ.0) THEN
                REGIONBOTTOMSURF=SN
                SURFTYPESPEC(SN)='PZ'
                SURFVALUESPEC(SN)=CURRENTSURF
                SN=SN+1
            ELSE
                REGIONBOTTOMSURF=CURRENTSURFLABEL
            ENDIF
            ENDIF
*     Write the cell specification for the APSR universe upper region.
        IF (REGION.EQ.1) THEN
            WRITE(30,6040) LN, FRUREGIONML(COLUMN,ROW,REGION),
c          (-1*REGABOVEAPSRA(REGION,2)),
c          REGIONBOTTOMSURF, APSRAUNIV(COLUMN,ROW), REGION
6040   FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 352 of 647

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c      ' IMP:N=1 U=',I3,' $ Upper core region ',I2)
      LN=LN+1
      REGIONTOPSURF=REGIONBOTTOMSURF
      ELSE
c      WRITE(30,6045) LN, FRUREGIONML(COLUMN,ROW,REGION),
c      (-1*REGABOVEAPSRA(REGION,2)), (-1*REGIONTOPSURF),
6045  REGIONBOTTOMSURF, APSRAUNIV(COLUMN,ROW), REGION
c      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Upper core region ',I2)
      LN=LN+1
      REGIONTOPSURF=REGIONBOTTOMSURF
      ENDIF
6050  CONTINUE
      SPACHEIGHT=0.0
*     Loop through the spacer and moderator regions along the axial
*     length of the GT (from top to bottom).
      DO 6051 SPN=1,NUMOFSPACERS(DESNUM(COLUMN,ROW))
        SPACHEIGHT=SPACHEIGHT+SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
6051  CONTINUE
      DO 6130 SPN=1,NUMOFSPACERS(DESNUM(COLUMN,ROW))
*     Define the homogenized spacer region bounding surfaces.
      IF (SPN.EQ.1) THEN
        SPACERTOPSURF=UEFBOTTOMSURF
        CURRENTSURF=SURFVALUESPEC(UEFBOTTOMSURF)-
c        SPACERHEIGHT(DESNUM(COLUMN,ROW),SPN)
        CURRENTSURFLABEL=0
        DO 6060 V=1,(SN-1)
          IF (SURFTYPESPEC(V).EQ.'PZ') THEN
            IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
              CURRENTSURFLABEL=V
              EXIT
            ENDIF
          ENDIF
6060  CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
            SPACERBOTTOMSURF=SN
            SURFTYPESPEC(SN)='PZ'
            SURFVALUESPEC(SN)=CURRENTSURF
            SN=SN+1
          ELSE
            SPACERBOTTOMSURF=CURRENTSURFLABEL
          ENDIF
          WATERREGIONTOPSURF=SPACERBOTTOMSURF
          CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),(SPN+1))
          CURRENTSURFLABEL=0
          DO 6070 V=1,(SN-1)
            IF (SURFTYPESPEC(V).EQ.'PZ') THEN
              IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                CURRENTSURFLABEL=V
                EXIT
              ENDIF
            ENDIF
6070  CONTINUE
            IF (CURRENTSURFLABEL.EQ.0) THEN

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 353 of 647

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        WATERREGIONBOTTOMSURF=SN
        SURFTYPESPEC (SN) = 'PZ'
        SURFVALUESPEC (SN) =CURRENTSURF
        SN=SN+1
    ELSE
        WATERREGIONBOTTOMSURF=CURRENTSURFLABEL
    ENDIF
ELSEIF ((SPN.NE.1).AND.(SPN.NE.
c NUMOFSPACERS (DESNUM (COLUMN, ROW))) THEN
    SPACERTOPSURF=WATERREGIONBOTTOMSURF
    CURRENTSURF=SURFVALUESPEC (WATERREGIONBOTTOMSURF) -
c SPACERHEIGHT (DESNUM (COLUMN, ROW) , SPN)
    CURRENTSURFLABEL=0
    DO 6080 V=1, (SN-1)
        IF (SURFTYPESPEC (V).EQ. 'PZ') THEN
        IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
            CURRENTSURFLABEL=V
            EXIT
        ENDIF
    ENDIF
6080 CONTINUE
    IF (CURRENTSURFLABEL.EQ.0) THEN
        SPACERBOTTOMSURF=SN
        SURFTYPESPEC (SN) = 'PZ'
        SURFVALUESPEC (SN) =CURRENTSURF
        SN=SN+1
    ELSE
        SPACERBOTTOMSURF=CURRENTSURFLABEL
    ENDIF
    WATERREGIONTOPSURF=SPACERBOTTOMSURF
    CURRENTSURF=SPACERDIST (DESNUM (COLUMN, ROW) , (SPN+1))
    CURRENTSURFLABEL=0
    DO 6090 V=1, (SN-1)
        IF (SURFTYPESPEC (V).EQ. 'PZ') THEN
        IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
            CURRENTSURFLABEL=V
            EXIT
        ENDIF
    ENDIF
6090 CONTINUE
    IF (CURRENTSURFLABEL.EQ.0) THEN
        WATERREGIONBOTTOMSURF=SN
        SURFTYPESPEC (SN) = 'PZ'
        SURFVALUESPEC (SN) =CURRENTSURF
        SN=SN+1
    ELSE
        WATERREGIONBOTTOMSURF=CURRENTSURFLABEL
    ENDIF
ELSEIF (SPN.EQ.NUMOFSPACERS (DESNUM (COLUMN, ROW))) THEN
    SPACERTOPSURF=WATERREGIONBOTTOMSURF
    CURRENTSURF=SURFVALUESPEC (WATERREGIONBOTTOMSURF) -
c SPACERHEIGHT (DESNUM (COLUMN, ROW) , SPN)
    CURRENTSURFLABEL=0
    DO 6100 V=1, (SN-1)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 354 of 647

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                IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
6100          CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    SPACERBOTTOMSURF=SN
                    SURFTYPESPEC(SN)='PZ'
                    SURFVALUESPEC(SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    SPACERBOTTOMSURF=CURRENTSURFLABEL
                ENDIF
                WATERREGIONTOPSURF=SPACERBOTTOMSURF
                WATERREGIONBOTTOMSURF=NODEBOTTOMSURF
            ENDIF
*           Write the current homogenized spacer region cell in this APSR universe.
                WRITE(30,6126) LN, HOMOSPACMLNUM(DESNUM(COLUMN,ROW),SPN),
c           (-1*HOMOSPACERDEN(DESNUM(COLUMN,ROW),SPN)), GTORSURF,
c           (-1*SPACERTOPSURF), SPACERBOTTOMSURF, APSRAUNIV(COLUMN,ROW),
c           SPN
6126          FORMAT(T1,I4,T6,I4,T11,G14.8,T25,I4,1X,I4,1X,I4,
c           ' IMP:N=1 U=',I3,' $ Homogenized region for spacer ',I2)
                LN=LN+1
*           Write the water region cell below the current homogenized spacer cell
in this APSR universe.
                WRITE(30,6127) LN, BMODML, (-1*MODDENSITY), GTORSURF,
c           (-1*WATERREGIONTOPSURF), WATERREGIONBOTTOMSURF,
c           APSRAUNIV(COLUMN,ROW)
6127          FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c           ' IMP:N=1 U=',I3,' $ Borated moderator')
                LN=LN+1
6130          CONTINUE
            ENDIF
6140          CONTINUE
6150          CONTINUE
            ENDIF
*           Write the specifications for the BPR universes that are
*           required to fill the assembly layout specifications previously defined.
                DO 9290 ROW=1,50
                    DO 9280 COLUMN=1,50
*           Write the BPR universe specification for the assembly if it
*           contains a unique BP material.
*
                IF (BPRUNIQUE(COLUMN,ROW).EQ..TRUE.) THEN
*           Write the BPR specification header.
                    WRITE(30,9072)
9072          FORMAT(T1,'C')
                    WRITE(30,9074) ASSYID(COLUMN,ROW)
9074          FORMAT(T1,
c           'C BPR UNIVERSE SPECIFICATION FOR ASSEMBLY ',A5)
                    WRITE(30,9076)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 355 of 647

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9076   FORMAT(T1, 'C')
      IF ((BANDW.EQ..TRUE.).OR.
c ((WESTINGHOUSE.EQ..TRUE.).AND.
c (WBPRA(BANKNUM(COLUMN,ROW)).EQ.1).AND.
c (GTSPLIT.NE.1))) THEN
      DO 9090 MCNPNODE=1,NUMOFBPRANODES(BANKNUM(COLUMN,ROW))
*   Define the upper end-fitting bottom surface.
      CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),1)+
c   ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
      CURRENTSURFLABEL=0
      DO 9077 V=1,(SN-1)
          IF (SURFTYPESPEC(V).EQ.'PZ') THEN
          IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
              CURRENTSURFLABEL=V
              EXIT
          ENDIF
      ENDIF
9077   CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          UEFBOTTOMSURF=SN
          SURFTYPESPEC(SN)='PZ'
          SURFVALUESPEC(SN)=CURRENTSURF
          SN=SN+1
      ELSE
          UEFBOTTOMSURF=CURRENTSURFLABEL
      ENDIF
*   Define the upper end-fitting top surface.
      CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),1)+
c   ENDFITHEIGHT(DESNUM(COLUMN,ROW),1)+
c   ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
      CURRENTSURFLABEL=0
      DO 9078 V=1,(SN-1)
          IF (SURFTYPESPEC(V).EQ.'PZ') THEN
          IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
              CURRENTSURFLABEL=V
              EXIT
          ENDIF
      ENDIF
9078   CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          UEFTOPSURF=SN
          SURFTYPESPEC(SN)='PZ'
          SURFVALUESPEC(SN)=CURRENTSURF
          SN=SN+1
      ELSE
          UEFTOPSURF=CURRENTSURFLABEL
      ENDIF
*   Define the BP node bounding surfaces.
      IF (MCNPNODE.EQ.1) THEN
          TOTBPHEIGHT=0.0
          DO 9079 Z=1,NUMOFBPRANODES(BANKNUM(COLUMN,ROW))
              TOTBPHEIGHT=TOTBPHEIGHT+
c   MCNPBPRAHEIGHT(BANKNUM(COLUMN,ROW),Z)
9079   CONTINUE

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 356 of 647

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      CURRENTSURF=BOTBPNODEHEIGHT (BANKNUM (COLUMN, ROW) ) +
c      TOTBPHEIGHT
      IF (CURRENTSURF.GE.SURFVALUESPEC (UEFTOPSURF) ) THEN
          CURRENTSURF=SURFVALUESPEC (UEFTOPSURF)
      ENDIF
      CURRENTSURFLABEL=0
      DO 9080 V=1, (SN-1)
          IF (SURFTYPESPEC (V) .EQ. 'PZ' ) THEN
      IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001) ) THEN
          CURRENTSURFLABEL=V
          EXIT
          ENDIF
      ENDIF
9080      CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          TOPBPNODETOPSURF=SN
          SURFTYPESPEC (SN) = 'PZ'
          SURFVALUESPEC (SN) =CURRENTSURF
          SN=SN+1
      ELSE
          TOPBPNODETOPSURF=CURRENTSURFLABEL
      ENDIF
      BPNODETOPSURF=TOPBPNODETOPSURF
      CURRENTSURF=SURFVALUESPEC (BPNODETOPSURF) -
c      MCNPBPRAHEIGHT (BANKNUM (COLUMN, ROW) , MCNPNODE)
      IF (CURRENTSURF.GE.SURFVALUESPEC (UEFTOPSURF) ) THEN
          CURRENTSURF=SURFVALUESPEC (UEFTOPSURF)
      ENDIF
      CURRENTSURFLABEL=0
      DO 9082 V=1, (SN-1)
          IF (SURFTYPESPEC (V) .EQ. 'PZ' ) THEN
      IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001) ) THEN
          CURRENTSURFLABEL=V
          EXIT
          ENDIF
      ENDIF
9082      CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          BPNODEBOTTOMSURF=SN
          SURFTYPESPEC (SN) = 'PZ'
          SURFVALUESPEC (SN) =CURRENTSURF
          SN=SN+1
      ELSE
          BPNODEBOTTOMSURF=CURRENTSURFLABEL
      ENDIF
      CURRENTSURF=BPRDIM (BANKNUM (COLUMN, ROW) , 1)
      CURRENTSURFLABEL=0
      DO 9083 V=1, (SN-1)
          IF (SURFTYPESPEC (V) .EQ. 'CZ' ) THEN
      IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001) ) THEN
          CURRENTSURFLABEL=V
          EXIT
          ENDIF
      ENDIF
      ENDIF
      ENDIF
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 357 of 647

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9083      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
              BPRADIUS=SN
              SURFTYPESPEC(SN)='CZ'
              SURFVALUESPEC(SN)=CURRENTSURF
              SN=SN+1
          ELSE
              BPRADIUS=CURRENTSURFLABEL
          ENDIF
          ELSEIF (MCNPNODE.NE.1) THEN
              BPNODETOPSURF=BPNODEBOTTOMSURF
              CURRENTSURF=SURFVALUESPEC(BPNODETOPSURF)-
c          MCNPBPRAHEIGHT(BANKNUM(COLUMN,ROW),MCNPNODE)
              IF (CURRENTSURF.GE.SURFVALUESPEC(UEFTOPSURF)) THEN
                  CURRENTSURF=SURFVALUESPEC(UEFTOPSURF)
              ENDIF
              CURRENTSURFLABEL=0
              DO 9084 V=1,(SN-1)
                  IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                      IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                          CURRENTSURFLABEL=V
                          EXIT
                      ENDIF
                  ENDIF
              ENDIF
9084      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
              BPNODEBOTTOMSURF=SN
              SURFTYPESPEC(SN)='PZ'
              SURFVALUESPEC(SN)=CURRENTSURF
              SN=SN+1
          ELSE
              BPNODEBOTTOMSURF=CURRENTSURFLABEL
          ENDIF
          ENDIF
          IF (SURFVALUESPEC(BPNODEBOTTOMSURF).LT.
c          SURFVALUESPEC(UEFTOPSURF)) THEN
*      Write the BP node cells in this BPR universe.
          IF ((BPRABSNODE(BANKNUM(COLUMN,ROW),MCNPNODE).EQ.'Y').AND.
c          (BPNONABSMAT(BANKNUM(COLUMN,ROW)).EQ.1)) THEN
              WRITE(30,9085) LN, BPNODEML,
c          (-1*AL2O3DENSITY(BANKNUM(COLUMN,ROW))), (-1*BPRADIUS),
c          (-1*BPNODETOPSURF), BPNODEBOTTOMSURF,
c          BPRAUNIV(COLUMN,ROW), MCNPNODE
9085      FORMAT(T1,I4,T6,I4,T11,G14.6,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I3,' $ Burnable poison node ',I2)
              LN=LN+1
              BPNODEML=BPNODEML+1
          ELSEIF ((BPRABSNODE(BANKNUM(COLUMN,ROW),MCNPNODE).EQ.'Y').AND.
c          (BPNONABSMAT(BANKNUM(COLUMN,ROW)).NE.1)) THEN
              WRITE(30,9086) LN, BPNODEML,
c          (-1*NONBPMATDATA(BANKNUM(COLUMN,ROW),1)), (-1*BPRADIUS),
c          (-1*BPNODETOPSURF), BPNODEBOTTOMSURF,
c          BPRAUNIV(COLUMN,ROW), MCNPNODE
9086      FORMAT(T1,I4,T6,I4,T11,G14.6,T25,I4,1X,I4,1X,I4,

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 358 of 647

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c      ' IMP:N=1 U=',I3,'      $ Burnable poison node ',I2)
      LN=LN+1
      BPNODEML=BPNODEML+1
    ELSE
      WRITE(30,9088) LN, BPNODEML,
c      (-1*BPDENTOGO(COLUMN,ROW,MCNPNODE)), (-1*BPRADIUS),
c      (-1*BPNODETOPSURF), BPNODEBOTTOMSURF,
c      BPRAUNIV(COLUMN,ROW), MCNPNODE
9088   FORMAT(T1,I4,T6,I4,T11,G14.6,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,'      $ Burnable poison node ',I2)
      LN=LN+1
      BPNODEML=BPNODEML+1
    ENDIF
  ENDIF
9090   CONTINUE
*     Define the BPR cladding inner radius.
      CURRENTSURF=BPRDIM(BANKNUM(COLUMN,ROW),2)
      CURRENTSURFLABEL=0
      DO 9092 V=1,(SN-1)
        IF (SURFTYPESPEC(V).EQ.'CZ') THEN
          IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
            CURRENTSURFLABEL=V
            EXIT
          ENDIF
        ENDIF
9092   CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
        BPCLADIRSURF=SN
        SURFTYPESPEC(SN)='CZ'
        SURFVALUESPEC(SN)=CURRENTSURF
        SN=SN+1
      ELSE
        BPCLADIRSURF=CURRENTSURFLABEL
      ENDIF
*     Define the BPR cladding outer radius.
      CURRENTSURF=BPRDIM(BANKNUM(COLUMN,ROW),3)
      CURRENTSURFLABEL=0
      DO 9094 V=1,(SN-1)
        IF (SURFTYPESPEC(V).EQ.'CZ') THEN
          IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
            CURRENTSURFLABEL=V
            EXIT
          ENDIF
        ENDIF
9094   CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
        BPCLADORSURF=SN
        SURFTYPESPEC(SN)='CZ'
        SURFVALUESPEC(SN)=CURRENTSURF
        SN=SN+1
      ELSE
        BPCLADORSURF=CURRENTSURFLABEL
      ENDIF
*     Define the BPR cladding top surface.

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 359 of 647

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          CURRENTSURF=TOTBPHEIGHT+
c         BOTBPNODEHEIGHT (BANKNUM (COLUMN, ROW) )+
c         BPRPLEN (BANKNUM (COLUMN, ROW) , 1)
          IF (CURRENTSURF.GE.SURFVALUESPEC (UEFTOPSURF) ) THEN
            CURRENTSURF=SURFVALUESPEC (UEFTOPSURF)
          ENDIF
          CURRENTSURFLABEL=0
          DO 9096 V=1, (SN-1)
            IF (SURFTYPESPEC (V) .EQ. 'PZ' ) THEN
          IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001) ) THEN
            CURRENTSURFLABEL=V
            EXIT
          ENDIF
          ENDIF
9096      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
            BPCLADTOPSURF=SN
            SURFTYPESPEC (SN)='PZ'
            SURFVALUESPEC (SN)=CURRENTSURF
            SN=SN+1
          ELSE
            BPCLADTOPSURF=CURRENTSURFLABEL
          ENDIF
*       Define the BPR cladding bottom surface.
          CURRENTSURF=BOTBPNODEHEIGHT (BANKNUM (COLUMN, ROW) )-
c         BPRPLEN (BANKNUM (COLUMN, ROW) , 2)
          CURRENTSURFLABEL=0
          DO 9098 V=1, (SN-1)
            IF (SURFTYPESPEC (V) .EQ. 'PZ' ) THEN
          IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001) ) THEN
            CURRENTSURFLABEL=V
            EXIT
          ENDIF
          ENDIF
9098      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
            BPCLADBOTTOMSURF=SN
            SURFTYPESPEC (SN)='PZ'
            SURFVALUESPEC (SN)=CURRENTSURF
            SN=SN+1
          ELSE
            BPCLADBOTTOMSURF=CURRENTSURFLABEL
          ENDIF
*       Write the BP-to-cladding gap cell in this BPR universe.
          WRITE (30, 9104) LN, (-1*BPCLADIRSURF), BPRADIUS,
c         (-1*TOPBPNODETOPSURF),
c         BPNODEBOTTOMSURF, BPRAUNIV (COLUMN, ROW)
9104      FORMAT (T1, I4, T6, '0', T25, I4, 1X, I4, 1X, I4, 1X, I4,
c         ' IMP:N=1 U=', I3,
c         ' $ Burnable poison-to-cladding gap')
          LN=LN+1
*       Write the BPR cladding cell in this BPR universe.
*       Determine if the BPR cladding material specification has
*       previously been defined. If it has been previously defined, determine

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 361 of 647

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                ENDIF
                ENDIF
9110             CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                    EXIT
                ENDIF
9111             CONTINUE
                ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
                    DO 9113 RO=1,1
                        DO 9112 CO=1,(COLUMN-1)
                            IF (BANKNUM(CO,RO).NE.0) THEN
                                IF (BANKDES(BANKNUM(CO,RO)).NE.'BPRA ') THEN
                                    IF (BPRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.
c                                     BPRCLADMAT(BANKNUM(CO,RO))) THEN
                                        CLADMLUNIQUE=.FALSE.
                                        LEAVE=.TRUE.
                                        BPCLADML(COLUMN,ROW)=BPCLADML(CO,RO)
                                        EXIT
                                    ENDIF
                                ENDIF
                            ENDIF
                        ENDIF
                    ENDIF
9112             CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                    EXIT
                ENDIF
9113             CONTINUE
                ENDIF
                IF (CLADMLUNIQUE.EQ..TRUE.) THEN
                    BPCLADML(COLUMN,ROW)=MN
* Check BPR Cladding Material
                    IF (BPRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.1) THEN
                        DO 9115 C=1,2
                            IF (C.EQ.1) THEN
                                WRITE(200,9300) BPCLADML(COLUMN,ROW)
                            ELSEIF (C.EQ.2) THEN
                                WRITE(200,9301)
                                WRITE(200,7000)
                                WRITE(200,7001)
                                WRITE(200,7002)
                                WRITE(200,9302)
                                WRITE(200,7003)
                                WRITE(200,7004)
                                WRITE(200,7005)
                                WRITE(200,9303)
                                WRITE(200,9304)
                            ENDIF
                        ENDIF
9115             CONTINUE
                ELSEIF (BPRCLADMAT(BANKNUM(COLUMN,ROW))
c                 .EQ.2) THEN
                    DO 9117 C=1,2
                        IF (C.EQ.1) THEN
                            WRITE(200,9305) BPCLADML(COLUMN,ROW)
                        ELSEIF (C.EQ.2) THEN
                            WRITE(200,9306)
                    ENDIF

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 362 of 647

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WRITE(200,9307)
WRITE(200,9308)
WRITE(200,9309)
WRITE(200,9310)
WRITE(200,7006)
WRITE(200,7007)
WRITE(200,7008)
WRITE(200,9311)
WRITE(200,9312)
WRITE(200,7009)
WRITE(200,7010)
WRITE(200,7011)
WRITE(200,9313)
WRITE(200,7012)
WRITE(200,7013)
WRITE(200,7014)
WRITE(200,7015)
ENDIF
9117 CONTINUE
ELSEIF (BPRCLADMAT(BANKNUM(COLUMN,ROW)
C .EQ.3) THEN
DO 9119 C=1,2
IF (C.EQ.1) THEN
WRITE(200,9314) BPCLADML(COLUMN,ROW)
ELSEIF (C.EQ.2) THEN
WRITE(200,9315)
WRITE(200,9316)
WRITE(200,9317)
WRITE(200,9318)
WRITE(200,7016)
WRITE(200,7017)
WRITE(200,7018)
WRITE(200,9319)
WRITE(200,9320)
WRITE(200,7019)
WRITE(200,7020)
WRITE(200,7021)
WRITE(200,9321)
WRITE(200,7022)
WRITE(200,7023)
WRITE(200,7024)
WRITE(200,7025)
WRITE(200,9322)
WRITE(200,9323)
WRITE(200,9324)
WRITE(200,9325)
WRITE(200,9326)
WRITE(200,9327)
WRITE(200,7026)
WRITE(200,9328)
WRITE(200,9329)
WRITE(200,9330)
ENDIF
9119 CONTINUE
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 363 of 647

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                ENDIF
                MN=MN+1
            ENDIF
            IF (BPRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.1) THEN
                CLADRHO=6.56
            ELSEIF (BPRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.2) THEN
                CLADRHO=7.90
            ELSEIF (BPRCLADMAT(BANKNUM(COLUMN,ROW)).EQ.3) THEN
                CLADRHO=8.19
            ENDIF
            WRITE(30,9131) LN, BPCLADML(COLUMN,ROW), (-1*CLADRHO),
c           BPCLADIRSURF,
c           (-1*BPCLADORSURF), (-1*BPCLADTOPSURF), BPCLADBOTTOMSURF,
c           BPRAUNIV(COLUMN,ROW)
9131          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
c           ' IMP:N=1 U=',I3,' $ BPR cladding')
            LN=LN+1
*           Write the BPR upper plenum cell in this BPR universe.
*           Determine if the BPR upper plenum material specification has
*           previously been defined. If it has been previously defined, determine
*           the upper plenum material specification label.
                BPRUPMLUNIQUE=.TRUE.
                LEAVE=.FALSE.
                IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
                    DO 9133 RO=1,(ROW-1)
                        DO 9132 CO=1,50
                            IF (BANKNUM(CO,RO).NE.0) THEN
                                IF (BANKNUM(COLUMN,ROW).EQ.
c                               BANKNUM(CO,RO)) THEN
                                    BPRUPMLUNIQUE=.FALSE.
                                    LEAVE=.TRUE.
                                    BPRUPML(COLUMN,ROW)=BPRUPML(CO,RO)
                                    EXIT
                                ENDIF
                            ENDIF
                        CONTINUE
                    IF (LEAVE.EQ..TRUE.) THEN
                        EXIT
                    ENDIF
                CONTINUE
9133          CONTINUE
                IF (LEAVE.EQ..FALSE.) THEN
                    DO 9135 RO=ROW,ROW
                        DO 9134 CO=1,(COLUMN-1)
                            IF (BANKNUM(CO,RO).NE.0) THEN
                                IF (BANKNUM(COLUMN,ROW).EQ.
c                               BANKNUM(CO,RO)) THEN
                                    BPRUPMLUNIQUE=.FALSE.
                                    LEAVE=.TRUE.
                                    BPRUPML(COLUMN,ROW)=BPRUPML(CO,RO)
                                    EXIT
                                ENDIF
                            ENDIF
                        CONTINUE
                    IF (LEAVE.EQ..TRUE.) THEN

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 364 of 647

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          EXIT
          ENDIF
9135      CONTINUE
          ENDIF
          ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
            DO 9137 RO=1,(ROW-1)
              DO 9136 CO=1,50
                IF (BANKNUM(CO,RO).NE.0) THEN
                  IF (BANKNUM(COLUMN,ROW).EQ.
c           BANKNUM(CO,RO)) THEN
                    BPRUPMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    BPRUPML(COLUMN,ROW)=BPRUPML(CO,RO)
                    EXIT
                  ENDIF
                ENDIF
9136      CONTINUE
                IF (LEAVE.EQ..TRUE.) THEN
                  EXIT
                ENDIF
9137      CONTINUE
                ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
                  DO 9139 RO=1,1
                    DO 9138 CO=1,(COLUMN-1)
                      IF (BANKNUM(CO,RO).NE.0) THEN
                        IF (BANKNUM(COLUMN,ROW).EQ.
c           BANKNUM(CO,RO)) THEN
                          BPRUPMLUNIQUE=.FALSE.
                          LEAVE=.TRUE.
                          BPRUPML(COLUMN,ROW)=BPRUPML(CO,RO)
                          EXIT
                        ENDIF
                      ENDIF
9138      CONTINUE
                      IF (LEAVE.EQ..TRUE.) THEN
                        EXIT
                      ENDIF
9139      CONTINUE
                      ENDIF
                      IF (SURFVALUESPEC(TOPBPNODETOPSURF).LT.
c           SURFVALUESPEC(UEFTOPSURF)) THEN
                        IF (BPRUPMLUNIQUE.EQ..TRUE.) THEN
                          BPRUPML(COLUMN,ROW)=MN
* Check Burnable Poison Rod Upper Plenum Regions
                          DO 9143 C=1,BPRUPLNEMAT(BANKNUM(COLUMN,ROW),2)
                            IF (C.EQ.1) THEN
c           WRITE(200,9140) BPRUPML(COLUMN,ROW),
c           BPRUPLENZAIDS(BANKNUM(COLUMN,ROW),C),
9140      (-1*BPRUPLNWT(S(BANKNUM(COLUMN,ROW),C))
c           FORMAT(T1,'M',I4,T9,A9,3X,G14.6,
c           '$ Burnable Poison Rod Upper Plenum')
                            ELSE
c           WRITE(200,9142)
c           BPRUPLENZAIDS(BANKNUM(COLUMN,ROW),C),

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 365 of 647

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      c          (-1*BPRUPLNWTS (BANKNUM (COLUMN, ROW) , C))
9142          FORMAT (T9, A9, 3X, G14.6)
              ENDIF
9143          CONTINUE
              MN=MN+1
              ENDIF
              WRITE (30, 9144) LN, BPRUPML (COLUMN, ROW) ,
      c          (-1*BPRUPLNMAT (BANKNUM (COLUMN, ROW) , 1)) ,
      c          TOPBPNODETOPSURF ,
      c          (-1*BPCLADTOPSURF) , (-1*BPCLADIRSURF) ,
      c          BPRAUNIV (COLUMN, ROW)
9144          FORMAT (T1, I4, T6, I4, T11, F8.5, T25, I4, 1X, I4, 1X, I4,
      c          ' IMP:N=1 U=', I3, ' $ BPR upper plenum region')
              LN=LN+1
              ENDIF
*          Write the BPR lower plenum cell (lower end plug) in this BPR universe.
*          Determine if the BPR lower plenum material specification has
*          previously been defined.  If it has been previously defined, determine
*          the lower plenum material specification label.
              BPRLPMLUNIQUE=.TRUE.
              LEAVE=.FALSE.
              IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
                  DO 9146 RO=1, (ROW-1)
                      DO 9145 CO=1, 50
                          IF (BANKNUM (CO, RO) .NE.0) THEN
                              IF (BANKNUM (COLUMN, ROW) .EQ. BANKNUM (CO, RO)) THEN
                                  BPRLPMLUNIQUE=.FALSE.
                                  LEAVE=.TRUE.
                                  BPRLPML (COLUMN, ROW) =BPRLPML (CO, RO)
                                  EXIT
                              ENDIF
                          ENDIF
                      ENDIF
                  CONTINUE
          9145          IF (LEAVE.EQ..TRUE.) THEN
                      EXIT
                  ENDIF
          9146          CONTINUE
                  IF (LEAVE.EQ..FALSE.) THEN
                      DO 9148 RO=ROW, ROW
                          DO 9147 CO=1, (COLUMN-1)
                              IF (BANKNUM (CO, RO) .NE.0) THEN
                                  IF (BANKNUM (COLUMN, ROW) .EQ.
      c          BANKNUM (CO, RO)) THEN
                                      BPRLPMLUNIQUE=.FALSE.
                                      LEAVE=.TRUE.
                                      BPRLPML (COLUMN, ROW) =BPRLPML (CO, RO)
                                      EXIT
                                  ENDIF
                              ENDIF
                          ENDIF
                      CONTINUE
          9147          IF (LEAVE.EQ..TRUE.) THEN
                      EXIT
                  ENDIF
          9148          CONTINUE

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 366 of 647

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        ENDIF
ELSEIF ((COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
    DO 9150 RO=1, (ROW-1)
        DO 9149 CO=1, 50
            IF (BANKNUM(CO,RO).NE.0) THEN
                IF (BANKNUM(COLUMN,ROW).EQ.
                    BANKNUM(CO,RO)) THEN
                    BPRLPMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    BPRLPML(COLUMN,ROW)=BPRLPML(CO,RO)
                    EXIT
                ENDIF
            ENDIF
9149        CONTINUE
            IF (LEAVE.EQ..TRUE.) THEN
                EXIT
            ENDIF
9150        CONTINUE
ELSEIF ((ROW.EQ.1).AND.(COLUMN.NE.1)) THEN
    DO 9152 RO=1,1
        DO 9151 CO=1, (COLUMN-1)
            IF (BANKNUM(CO,RO).NE.0) THEN
                IF (BANKNUM(COLUMN,ROW).EQ.
                    BANKNUM(CO,RO)) THEN
                    BPRLPMLUNIQUE=.FALSE.
                    LEAVE=.TRUE.
                    BPRLPML(COLUMN,ROW)=BPRLPML(CO,RO)
                    EXIT
                ENDIF
            ENDIF
9151        CONTINUE
            IF (LEAVE.EQ..TRUE.) THEN
                EXIT
            ENDIF
9152        CONTINUE
ENDIF
IF (BPRLPMLUNIQUE.EQ..TRUE.) THEN
    BPRLPML(COLUMN,ROW)=MN
* Check Burnable Poison Rod Lower Plenum Regions
    DO 9155 C=1, BPRLPLENMAT(BANKNUM(COLUMN,ROW),2)
        IF (C.EQ.1) THEN
            WRITE(200,9153) BPRLPML(COLUMN,ROW),
                BPRLPLENZAZIDS(BANKNUM(COLUMN,ROW),C),
                (-1*BPRLPLENWTS(BANKNUM(COLUMN,ROW),C))
9153        FORMAT(T1,'M',I4,T9,A9,3X,G14.6,
            ' $ Burnable Poison Rod Lower Plenum')
        ELSE
            WRITE(200,9154)
                BPRLPLENZAZIDS(BANKNUM(COLUMN,ROW),C),
                (-1*BPRLPLENWTS(BANKNUM(COLUMN,ROW),C))
9154        FORMAT(T9,A9,3X,G14.6)
        ENDIF
9155        CONTINUE
    MN=MN+1

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 367 of 647

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      ENDIF
      WRITE(30,9156) LN, BPRLPML(COLUMN,ROW),
c      (-1*BPRLPLENMAT(BANKNUM(COLUMN,ROW),1)), BPCLABOTTOMSURF,
c      (-1*BPNODEBOTTOMSURF), (-1*BPCLADIRSURF),
c      BPRAUNIV(COLUMN,ROW)
9156  FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ BPR lower plenum region')
      LN=LN+1
*   Define the GT top surface.
      CURRENTSURF=GTDATA(DESNUM(COLUMN,ROW),3)
      IF (CURRENTSURF.GE.SURFVALUESPEC(UFTOPSURF)) THEN
          CURRENTSURF=SURFVALUESPEC(UFTOPSURF)
      ENDIF
      CURRENTSURFLABEL=0
      DO 9157 V=1,(SN-1)
          IF (SURFTYPESPEC(V).EQ.'PZ') THEN
              IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                  CURRENTSURFLABEL=V
                  EXIT
              ENDIF
          ENDIF
9157  CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          GTTOPSURF=SN
          SURFTYPESPEC(SN)='PZ'
          SURFVALUESPEC(SN)=CURRENTSURF
          SN=SN+1
      ELSE
          GTTOPSURF=CURRENTSURFLABEL
      ENDIF
*   Define the GT bottom surface.
      CURRENTSURF=GTDATA(DESNUM(COLUMN,ROW),4)
      CURRENTSURFLABEL=0
      DO 9158 V=1,(SN-1)
          IF (SURFTYPESPEC(V).EQ.'PZ') THEN
              IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                  CURRENTSURFLABEL=V
                  EXIT
              ENDIF
          ENDIF
9158  CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          GTBOTSURF=SN
          SURFTYPESPEC(SN)='PZ'
          SURFVALUESPEC(SN)=CURRENTSURF
          SN=SN+1
      ELSE
          GTBOTSURF=CURRENTSURFLABEL
      ENDIF
*   Define the GT outer radius surface.
      CURRENTSURF=GTDATA(DESNUM(COLUMN,ROW),2)
      CURRENTSURFLABEL=0
      DO 9159 V=1,(SN-1)
          IF (SURFTYPESPEC(V).EQ.'CZ') THEN

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 368 of 647

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          IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                CURRENTSURFLABEL=V
                EXIT
          ENDIF
        ENDIF
9159      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
                GTORSURF=SN
                SURFTYPESPEC(SN)='CZ'
                SURFVALUESPEC(SN)=CURRENTSURF
                SN=SN+1
          ELSE
                GTORSURF=CURRENTSURFLABEL
          ENDIF
*        Define the GT inner radius surface.
          CURRENTSURF=GTDATA(DESNUM(COLUMN,ROW),1)
          CURRENTSURFLABEL=0
          DO 9160 V=1,(SN-1)
                IF (SURFTYPESPEC(V).EQ.'CZ') THEN
          IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                CURRENTSURFLABEL=V
                EXIT
          ENDIF
        ENDIF
9160      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
                GTIRSURF=SN
                SURFTYPESPEC(SN)='CZ'
                SURFVALUESPEC(SN)=CURRENTSURF
                SN=SN+1
          ELSE
                GTIRSURF=CURRENTSURFLABEL
          ENDIF
*        Define the lower end-fitting top surface.
          CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
          CURRENTSURFLABEL=0
          DO 9161 V=1,(SN-1)
                IF (SURFTYPESPEC(V).EQ.'PZ') THEN
          IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                CURRENTSURFLABEL=V
                EXIT
          ENDIF
        ENDIF
9161      CONTINUE
          IF (CURRENTSURFLABEL.EQ.0) THEN
                BPLEFTTOPSURF=SN
                SURFTYPESPEC(SN)='PZ'
                SURFVALUESPEC(SN)=CURRENTSURF
                SN=SN+1
          ELSE
                BPLEFTTOPSURF=CURRENTSURFLABEL
          ENDIF
*        Write the lower end-fitting cell specification for this BPR universe.
          IF (SURFVALUESPEC(GTBOTSURF).GE.

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 369 of 647

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c      ENDFITHEIGHT(DESNUM(COLUMN,ROW),2) THEN
c      WRITE(30,9162) LN, FRLEFML(COLUMN,ROW),
c      (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*BPLEFTOPSURF),
c      BPRAUNIV(COLUMN,ROW)
9162   FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,' IMP:N=1 U=',I3,
c      '$ Assembly lower end-fitting')
c      LN=LN+1
      ELSE
c      WRITE(30,9163) LN, FRLEFML(COLUMN,ROW),
c      (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*BPLEFTOPSURF),
c      GTORSURF, BPRAUNIV(COLUMN,ROW)
9163   FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Assembly lower end-fitting')
c      LN=LN+1
c      WRITE(30,9164) LN, FRLEFML(COLUMN,ROW),
c      (-1*LEFMAT(DESNUM(COLUMN,ROW),1)), (-1*GTBOTSURF),
c      (-1*GTORSURF), BPRAUNIV(COLUMN,ROW)
9164   FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Assembly lower end-fitting')
c      LN=LN+1
      ENDIF
*      Write the upper end-fitting cell specification for this BPR universe.
      IF ((SURFVALUESPEC(BPCLADTOPSURF).LE.
c      SURFVALUESPEC(UEFBOTTOMSURF)).AND.
c      (SURFVALUESPEC(GTTOPSURF).LE.
c      SURFVALUESPEC(UEFBOTTOMSURF))) THEN
c      WRITE(30,9170) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c      (-1*UEFTOPSURF), BPRAUNIV(COLUMN,ROW)
9170   FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
c      LN=LN+1
      ELSEIF ((SURFVALUESPEC(BPCLADTOPSURF).GT.
c      SURFVALUESPEC(UEFBOTTOMSURF)).AND.
c      (SURFVALUESPEC(BPCLADTOPSURF).LT.
c      SURFVALUESPEC(UEFTOPSURF)).AND.
c      (SURFVALUESPEC(GTTOPSURF).LE.
c      SURFVALUESPEC(UEFBOTTOMSURF))) THEN
c      WRITE(30,9172) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c      (-1*UEFTOPSURF), BPCLADORSURF, BPRAUNIV(COLUMN,ROW)
9172   FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
c      LN=LN+1
c      WRITE(30,9174) LN, FRUEFML(COLUMN,ROW),
c      (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), BPCLADTOPSURF,
c      (-1*UEFTOPSURF), (-1*BPCLADORSURF),
c      BPRAUNIV(COLUMN,ROW)
9174   FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
c      LN=LN+1
      ELSEIF ((SURFVALUESPEC(BPCLADTOPSURF).LE.
c      SURFVALUESPEC(GTTOPSURF)).AND.
c      (SURFVALUESPEC(GTTOPSURF).LT.

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 370 of 647

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c      SURFVALUESPEC (UEFTOPSURF) ) .AND.
c      (SURFVALUESPEC (GTTOPSURF) ) .GT.
c      SURFVALUESPEC (UEFBOTTOMSURF) ) ) THEN
          WRITE (30,9176) LN, FRUEFML (COLUMN,ROW) ,
c          (-1*UEFMAT (DESNUM (COLUMN,ROW) ,1) ) , UEFBOTTOMSURF,
c          (-1*UEFTOPSURF) , GTORSURF, BPRAUNIV (COLUMN,ROW)
9176      FORMAT (T1, I4, T6, I4, T11, F8.5, T25, I4, 1X, I4, 1X, I4,
c          ' IMP:N=1 U=', I3, ' $ Assembly upper end-fitting')
          LN=LN+1
          WRITE (30,9178) LN, FRUEFML (COLUMN,ROW) ,
c          (-1*UEFMAT (DESNUM (COLUMN,ROW) ,1) ) , GTTOPSURF,
c          (-1*UEFTOPSURF) , (-1*GTORSURF) ,
c          BPRAUNIV (COLUMN,ROW)
9178      FORMAT (T1, I4, T6, I4, T11, F8.5, T25, I4, 1X, I4, 1X, I4,
c          ' IMP:N=1 U=', I3, ' $ Assembly upper end-fitting')
          LN=LN+1
          WRITE (30,9180) LN, BMODML,
c          (-1*MODDENSITY) , BPCLADTOPSURF,
c          (-1*GTTOPSURF) , (-1*GTIRSURF) ,
c          BPRAUNIV (COLUMN,ROW)
9180      FORMAT (T1, I4, T6, I4, T11, F8.5, T25, I4, 1X, I4, 1X, I4,
c          ' IMP:N=1 U=', I3, ' $ Assembly upper end-fitting')
          LN=LN+1
      ELSEIF ((SURFVALUESPEC (BPCLADTOPSURF) ) .LE.
c      SURFVALUESPEC (GTTOPSURF) ) .AND.
c      (SURFVALUESPEC (GTTOPSURF) ) .EQ.
c      SURFVALUESPEC (UEFTOPSURF) ) ) THEN
          WRITE (30,9182) LN, FRUEFML (COLUMN,ROW) ,
c          (-1*UEFMAT (DESNUM (COLUMN,ROW) ,1) ) , UEFBOTTOMSURF,
c          (-1*UEFTOPSURF) , GTORSURF, BPRAUNIV (COLUMN,ROW)
9182      FORMAT (T1, I4, T6, I4, T11, F8.5, T25, I4, 1X, I4, 1X, I4,
c          ' IMP:N=1 U=', I3, ' $ Assembly upper end-fitting')
          LN=LN+1
      IF (SURFVALUESPEC (BPCLADTOPSURF) ) .LT.
c      SURFVALUESPEC (GTTOPSURF) ) THEN
          WRITE (30,9184) LN, BMODML,
c          (-1*MODDENSITY) , BPCLADTOPSURF,
c          (-1*UEFTOPSURF) , (-1*GTIRSURF) ,
c          BPRAUNIV (COLUMN,ROW)
9184      FORMAT (T1, I4, T6, I4, T11, F8.5, T25, I4, 1X, I4, 1X, I4,
c          ' IMP:N=1 U=', I3, ' $ Assembly upper end-fitting')
          LN=LN+1
      ENDIF
      ELSEIF ((SURFVALUESPEC (BPCLADTOPSURF) ) .GT.
c      SURFVALUESPEC (UEFBOTTOMSURF) ) .AND.
c      (SURFVALUESPEC (BPCLADTOPSURF) ) .LT.
c      SURFVALUESPEC (UEFTOPSURF) ) .AND.
c      (SURFVALUESPEC (GTTOPSURF) ) .GT.
c      SURFVALUESPEC (UEFBOTTOMSURF) ) .AND.
c      (SURFVALUESPEC (GTTOPSURF) ) .LT.
c      SURFVALUESPEC (BPCLADTOPSURF) ) ) THEN
          WRITE (30,9186) LN, FRUEFML (COLUMN,ROW) ,
c          (-1*UEFMAT (DESNUM (COLUMN,ROW) ,1) ) , UEFBOTTOMSURF,
c          (-1*UEFTOPSURF) , GTORSURF, BPRAUNIV (COLUMN,ROW)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 371 of 647

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9186      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
          LN=LN+1
          WRITE(30,9188) LN, FRUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), GTTOPSURF,
c          (-1*UEFTOPSURF), (-1*GTORSURF),
c          BPCLADORSURF, BPRAUNIV(COLUMN,ROW)
9188      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          1X,I4,' IMP:N=1 U=',I3,
c          ' $ Assembly upper end-fitting')
          LN=LN+1
          WRITE(30,9190) LN, FRUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), BPCLADTOPSURF,
c          (-1*UEFTOPSURF), (-1*BPCLADORSURF),
c          BPRAUNIV(COLUMN,ROW)
9190      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
          LN=LN+1
          ELSEIF ((SURFVALUESPEC(BPCLADTOPSURF).EQ.
c          SURFVALUESPEC(UEFTOPSURF)).AND.
c          (SURFVALUESPEC(GTTOPSURF).GT.
c          SURFVALUESPEC(UEFBOTTOMSURF)).AND.
c          (SURFVALUESPEC(GTTOPSURF).LT.
c          SURFVALUESPEC(BPCLADTOPSURF))) THEN
          WRITE(30,9192) LN, FRUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c          (-1*UEFTOPSURF), GTORSURF, BPRAUNIV(COLUMN,ROW)
9192      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
          LN=LN+1
          WRITE(30,9194) LN, FRUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), GTTOPSURF,
c          (-1*UEFTOPSURF), (-1*GTORSURF),
c          BPCLADORSURF, BPRAUNIV(COLUMN,ROW)
9194      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          1X,I4,' IMP:N=1 U=',I3,
c          ' $ Assembly upper end-fitting')
          LN=LN+1
          ELSEIF ((SURFVALUESPEC(BPCLADTOPSURF).GT.
c          SURFVALUESPEC(UEFBOTTOMSURF)).AND.
c          (SURFVALUESPEC(BPCLADTOPSURF).LT.
c          SURFVALUESPEC(UEFTOPSURF)).AND.
c          (SURFVALUESPEC(GTTOPSURF).EQ.
c          SURFVALUESPEC(BPCLADTOPSURF))) THEN
          WRITE(30,9196) LN, FRUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), UEFBOTTOMSURF,
c          (-1*UEFTOPSURF), GTORSURF, BPRAUNIV(COLUMN,ROW)
9196      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I3,' $ Assembly upper end-fitting')
          LN=LN+1
          WRITE(30,9198) LN, FRUEFML(COLUMN,ROW),
c          (-1*UEFMAT(DESNUM(COLUMN,ROW),1)), GTTOPSURF,
c          (-1*UEFTOPSURF), (-1*GTORSURF),
c          BPCLADORSURF, BPRAUNIV(COLUMN,ROW)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 372 of 647

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9198          FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c             1X,I4,' IMP:N=1 U=',I3,
c             '$ Assembly upper end-fitting')
             LN=LN+1
             ENDIF
*           Write the GT material cell in this BPR universe.
*           Determine if the GT material specification has
*           previously been defined.  If it has been previously defined, determine
*           the material specification label.
             CLADMLUNIQUE=.TRUE.
             LEAVE=.FALSE.
             IF ((COLUMN.NE.1).AND.(ROW.NE.1)) THEN
               DO 9201 RO=1,(ROW-1)
                 DO 9200 CO=1,50
                   IF (DESNUM(CO,RO).NE.0) THEN
                     IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.
c                    GTMAT(DESNUM(CO,RO))) THEN
                       CLADMLUNIQUE=.FALSE.
                       LEAVE=.TRUE.
                       GTML(COLUMN,ROW)=GTML(CO,RO)
                       EXIT
                     ENDIF
                   ENDIF
                 CONTINUE
                 IF (LEAVE.EQ..TRUE.) THEN
                   EXIT
                 ENDIF
             CONTINUE
             IF (LEAVE.EQ..FALSE.) THEN
               DO 9203 RO=ROW,ROW
                 DO 9202 CO=1,(COLUMN-1)
                   IF (DESNUM(CO,RO).NE.0) THEN
                     IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.
c                    GTMAT(DESNUM(CO,RO))) THEN
                       CLADMLUNIQUE=.FALSE.
                       LEAVE=.TRUE.
                       GTML(COLUMN,ROW)=GTML(CO,RO)
                       EXIT
                     ENDIF
                   ENDIF
                 CONTINUE
                 IF (LEAVE.EQ..TRUE.) THEN
                   EXIT
                 ENDIF
             CONTINUE
             CONTINUE
             IF (COLUMN.EQ.1).AND.(ROW.NE.1)) THEN
               DO 9205 RO=1,(ROW-1)
                 DO 9204 CO=1,50
                   IF (DESNUM(CO,RO).NE.0) THEN
                     IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.
c                    GTMAT(DESNUM(CO,RO))) THEN
                       CLADMLUNIQUE=.FALSE.
                       LEAVE=.TRUE.

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 374 of 647

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WRITE(200,9307)
WRITE(200,9308)
WRITE(200,9309)
WRITE(200,9310)
WRITE(200,7006)
WRITE(200,7007)
WRITE(200,7008)
WRITE(200,9311)
WRITE(200,9312)
WRITE(200,7009)
WRITE(200,7010)
WRITE(200,7011)
WRITE(200,9313)
WRITE(200,7012)
WRITE(200,7013)
WRITE(200,7014)
WRITE(200,7015)
ENDIF
9212 CONTINUE
ELSEIF (GTMAT(DESNUM(COLUMN,ROW)
      C .EQ.3) THEN
      DO 9214 C=1,2
      IF (C.EQ.1) THEN
      WRITE(200,9314) GTML(COLUMN,ROW)
      ELSEIF (C.EQ.2) THEN
      WRITE(200,9315)
      WRITE(200,9316)
      WRITE(200,9317)
      WRITE(200,9318)
      WRITE(200,7016)
      WRITE(200,7017)
      WRITE(200,7018)
      WRITE(200,9319)
      WRITE(200,9320)
      WRITE(200,7019)
      WRITE(200,7020)
      WRITE(200,7021)
      WRITE(200,9321)
      WRITE(200,7022)
      WRITE(200,7023)
      WRITE(200,7024)
      WRITE(200,7025)
      WRITE(200,9322)
      WRITE(200,9323)
      WRITE(200,9324)
      WRITE(200,9325)
      WRITE(200,9326)
      WRITE(200,9327)
      WRITE(200,7026)
      WRITE(200,9328)
      WRITE(200,9329)
      WRITE(200,9330)
      ENDIF
9214 CONTINUE
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 375 of 647

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                ENDIF
                MN=MN+1
            ENDIF
            IF (GTMAT(DESNUM(COLUMN,ROW)).EQ.1) THEN
                CLADRHO=6.56
            ELSEIF (GTMAT(DESNUM(COLUMN,ROW)).EQ.2) THEN
                CLADRHO=7.90
            ELSEIF (GTMAT(DESNUM(COLUMN,ROW)).EQ.3) THEN
                CLADRHO=8.19
            ENDIF
            WRITE(30,9225) LN, GTML(COLUMN,ROW), (-1*CLADRHO),
c          GTIRSURF,
c          (-1*GTORSURF), (-1*GTTOPSURF), GTBOTSURF,
c          BPRAUNIV(COLUMN,ROW)
9225      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I3,' $ Guide tube region')
            LN=LN+1
*        Write the moderator cells within the GT in this BPR universe.
            IF (SURFVALUESPEC(BPCLADTOPSURF).GE.
c          SURFVALUESPEC(GTTOPSURF)) THEN
                WRITE(30,9226) LN, BMODML, (-1*MODDENSITY),
c          (-1*GTIRSURF),
c          BPCLADORSURF, (-1*GTTOPSURF), GTBOTSURF,
c          BPRAUNIV(COLUMN,ROW)
9226      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I3,
c          ' $ Borated moderator inside guide tube')
            LN=LN+1
            ELSEIF (SURFVALUESPEC(BPCLADTOPSURF).LT.
c          SURFVALUESPEC(GTTOPSURF)) THEN
                WRITE(30,9227) LN, BMODML, (-1*MODDENSITY),
c          (-1*GTIRSURF),
c          BPCLADORSURF, (-1*BPCLADTOPSURF), GTBOTSURF,
c          BPRAUNIV(COLUMN,ROW)
9227      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I3,
c          ' $ Borated moderator inside guide tube')
            LN=LN+1
            ENDIF
            WRITE(30,9228) LN, BMODML, (-1*MODDENSITY),
c          (-1*BPCLADORSURF), (-1*BPCLADBOTOMSURF), GTBOTSURF,
c          BPRAUNIV(COLUMN,ROW)
9228      FORMAT(T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,1X,I4,
c          ' IMP:N=1 U=',I3,' $ Borated moderator inside guide tube')
            LN=LN+1
*        Loop through the regions above the BPR (i.e. the appropriate upper core
regions)
*        Define the upper region lower surface.
                DO 9232 REGION=1,NUMREGABOVEBPRA
*        Determine the current upper region's lower surface specification.
                IF (REGION.EQ.1) THEN
                    REGIONTOPSURF=SYSTEMTOP
                    CURRENTSURF=SURFVALUESPEC(SYSTEMTOP)-
c          REGABOVEBPRA(REGION,1)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 376 of 647

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                ENDIF
                CURRENTSURF=SURFVALUESPEC (REGIONTOPSURF) -
c             REGABOVEBPRA (REGION, 1)
                IF (REGION.EQ.NUMREGABOVEBPRA) THEN
                    REGIONBOTTOMSURF=UEFTOPSURF
                ELSE
                    CURRENTSURFLABEL=0
                    DO 9229 V=1, (SN-1)
                        IF (SURFTYPESPEC (V).EQ.'PZ') THEN
                            IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT.(0.0001)) THEN
                                CURRENTSURFLABEL=V
                                EXIT
                            ENDIF
                        ENDIF
                    CONTINUE
                    IF (CURRENTSURFLABEL.EQ.0) THEN
                        REGIONBOTTOMSURF=SN
                        SURFTYPESPEC (SN)='PZ'
                        SURFVALUESPEC (SN)=CURRENTSURF
                        SN=SN+1
                    ELSE
                        REGIONBOTTOMSURF=CURRENTSURFLABEL
                    ENDIF
                ENDIF
*   Write the cell specification for the BPR universe upper region.
                IF (REGION.EQ.1) THEN
c             WRITE(30,9230) LN, FRUREGIONML (COLUMN,ROW,REGION),
                    (-1*REGABOVEBPRA (REGION,2)),
c             REGIONBOTTOMSURF, BPRAUNIV (COLUMN,ROW), REGION
9230          FORMAT (T1,I4,T6,I4,T11,F8.5,T25,I4,
c             ' IMP:N=1 U=',I3,' $ Upper core region ',I2)
                    LN=LN+1
                    REGIONTOPSURF=REGIONBOTTOMSURF
                ELSE
c             WRITE(30,9231) LN, FRUREGIONML (COLUMN,ROW,REGION),
                    (-1*REGABOVEBPRA (REGION,2)), (-1*REGIONTOPSURF),
c             REGIONBOTTOMSURF, BPRAUNIV (COLUMN,ROW), REGION
9231          FORMAT (T1,I4,T6,I4,T11,F8.5,T25,I4,1X,I4,
c             ' IMP:N=1 U=',I3,' $ Upper core region ',I2)
                    LN=LN+1
                    REGIONTOPSURF=REGIONBOTTOMSURF
                ENDIF
9232          CONTINUE
                SPACHEIGHT=0.0
*   Loop through the spacer and moderator regions along the axial
*   length of the BPR (from top to bottom).
                DO 9233 SPN=1,NUMOFSPACERS (DESNUM (COLUMN,ROW))
                    SPACHEIGHT=SPACHEIGHT+SPACERHEIGHT (DESNUM (COLUMN,ROW),SPN)
9233          CONTINUE
                DO 9270 SPN=1,NUMOFSPACERS (DESNUM (COLUMN,ROW))
*   Define the homogenized spacer region bounding surfaces.
                IF (SPN.EQ.1) THEN
                    SPACERTOPSURF=UEFBOTTOMSURF
                    CURRENTSURF=SURFVALUESPEC (UEFBOTTOMSURF) -

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 377 of 647

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c          SPACERHEIGHT (DESNUM (COLUMN, ROW) , SPN)
          CURRENTSURFLABEL=0
          DO 9234 V=1, (SN-1)
            IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
        ENDIF
      ENDIF
9234      CONTINUE
          IF (CURRENTSURFLABEL .EQ. 0) THEN
            SPACERBOTTOMSURF=SN
            SURFTYPESPEC (SN) = 'PZ'
            SURFVALUESPEC (SN) =CURRENTSURF
            SN=SN+1
          ELSE
            SPACERBOTTOMSURF=CURRENTSURFLABEL
          ENDIF
          WATERREGIONTOPSURF=SPACERBOTTOMSURF
          CURRENTSURF=SPACERDIST (DESNUM (COLUMN, ROW) , (SPN+1))
          CURRENTSURFLABEL=0
          DO 9236 V=1, (SN-1)
            IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
          CURRENTSURFLABEL=V
          EXIT
        ENDIF
      ENDIF
9236      CONTINUE
          IF (CURRENTSURFLABEL .EQ. 0) THEN
            WATERREGIONBOTTOMSURF=SN
            SURFTYPESPEC (SN) = 'PZ'
            SURFVALUESPEC (SN) =CURRENTSURF
            SN=SN+1
          ELSE
            WATERREGIONBOTTOMSURF=CURRENTSURFLABEL
          ENDIF
          ELSEIF ((SPN.NE.1) .AND. (SPN.NE.
c          NUMOFSPACERS (DESNUM (COLUMN, ROW) ))) THEN
            SPACERTOPSURF=WATERREGIONBOTTOMSURF
            CURRENTSURF=SURFVALUESPEC (WATERREGIONBOTTOMSURF) -
c          SPACERHEIGHT (DESNUM (COLUMN, ROW) , SPN)
            CURRENTSURFLABEL=0
            DO 9238 V=1, (SN-1)
              IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
            CURRENTSURFLABEL=V
            EXIT
          ENDIF
        ENDIF
9238      CONTINUE
          IF (CURRENTSURFLABEL .EQ. 0) THEN
            SPACERBOTTOMSURF=SN
            SURFTYPESPEC (SN) = 'PZ'
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00 Attachment I, Page 378 of 647

```

SURFVALUESPEC (SN) =CURRENTSURF
SN=SN+1
ELSE
  SPACERBOTTOMSURF=CURRENTSURFLABEL
ENDIF
WATERREGIONTOPSURF=SPACERBOTTOMSURF
CURRENTSURF=SPACERDIST (DESNUM (COLUMN, ROW) , (SPN+1))
CURRENTSURFLABEL=0
DO 9240 V=1, (SN-1)
  IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
  CURRENTSURFLABEL=V
  EXIT
  ENDIF
ENDIF
CONTINUE
IF (CURRENTSURFLABEL .EQ. 0) THEN
  WATERREGIONBOTTOMSURF=SN
  SURFTYPESPEC (SN) = 'PZ'
  SURFVALUESPEC (SN) =CURRENTSURF
  SN=SN+1
ELSE
  WATERREGIONBOTTOMSURF=CURRENTSURFLABEL
ENDIF
ELSEIF (SPN .EQ. NUMOFSPACERS (DESNUM (COLUMN, ROW))) THEN
  SPACERTOPSURF=WATERREGIONBOTTOMSURF
  CURRENTSURF=SURFVALUESPEC (WATERREGIONBOTTOMSURF) -
  SPACERHEIGHT (DESNUM (COLUMN, ROW) , SPN)
  CURRENTSURFLABEL=0
DO 9242 V=1, (SN-1)
  IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
  CURRENTSURFLABEL=V
  EXIT
  ENDIF
ENDIF
CONTINUE
IF (CURRENTSURFLABEL .EQ. 0) THEN
  SPACERBOTTOMSURF=SN
  SURFTYPESPEC (SN) = 'PZ'
  SURFVALUESPEC (SN) =CURRENTSURF
  SN=SN+1
ELSE
  SPACERBOTTOMSURF=CURRENTSURFLABEL
ENDIF
WATERREGIONTOPSURF=SPACERBOTTOMSURF
WATERREGIONBOTTOMSURF=NODEBOTTOMSURF
ENDIF
* Write the current homogenized spacer region cell in this BPR universe.
WRITE (30, 9268) LN, HOMOSPACMLNUM (DESNUM (COLUMN, ROW) , SPN) ,
(-1 *HOMOSPACERDEN (DESNUM (COLUMN, ROW) , SPN)) , GTORSURF ,
(-1 *SPACERTOPSURF) , SPACERBOTTOMSURF , BPRAUNIV (COLUMN, ROW) ,
SPN
9268 FORMAT (T1, I4, T6, I4, T11, G14.8, T25, I4, 1X, I4, 1X, I4,

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 379 of 647

```

c      ' IMP:N=1 U=',I3,'      $ Homogenized region for spacer ',I2)
      LN=LN+1
*      Write the water region cell below the current homogenized spacer cell
in this BPR universe.
      WRITE(30,9269) LN, BMODML, (-1*MODDENSITY), GTORSURF,
c      (-1*WATERREGIONTOPSURF), WATERREGIONBOTTOMSURF,
c      BPRAUNIV(COLUMN,ROW)
9269   FORMAT(T1,I4,T6,I4,T11,F10.8,T25,I4,1X,I4,1X,I4,
c      ' IMP:N=1 U=',I3,'      $ Borated moderator')
      LN=LN+1
9270   CONTINUE
      ELSE
      CALL WESTBPR(BANKNUM, BMODML, BPCLADML, BPNODEML,
c BPRANUV, BPRCLADMAT, BPRLPML, BPRUPML, COLUMN, DESNUM,
c FRLEFML, FRUEFML, FRUREGIONML, GTAXMAT, GTAXML, GTDATA,
c GTMAT, GTML, GTSPLIT, HOMOSPACMLNUM, LN, MN,
c NUMOFBPRANODES, NUMOFGTAXS, NUMOFSPACERS,
c NUMREGABOVEBPRA, ROW, SN, SYSTEMTOP, WBPRA,
c WBPRATYPE, AL2O3B4CDENSITY, AL2O3DENSITY,
c BOTBPNODEHEIGHT, BPDENTOGO, BPNONABSMAT,
c BPRAXDIM, BPRDIM, BPRPLENMAT, BPRPLENWTS,
c BPRPLEN, BPRUPLENMAT, BPRUPLENWTS, ENDFITHEIGHT,
c GTAXDATA, HOMOSPACERDEN, LEFMAT, MCNPBPRAHEIGHT,
c MODDENSITY, NONBPMATDATA, REGABOVEBPRA,
c SPACERDIST, SPACERHEIGHT, SURFVALUESPEC, UEFMAT,
c BANKDES, BPRABSNO, BPRPLENZAIDS,
c BPRUPLENZAIDS, CURRENTSURFLABEL, SURFTYPESPEC,
c NODEBOTTOMSURF)
      ENDIF
      ENDIF
9280   CONTINUE
9290   CONTINUE
      CLOSE(UNIT=30)

      RETURN
      END

*****
*      SUBROUTINE SURFSECTION
*      This subroutine writes the introduction section of the MCNP
*      input deck.
*****
      SUBROUTINE SURFSECTION (SN, EFPD, SURFVALUESPEC, SURFTYPESPEC,
c PREFIX, CYCLE, SURFFILE, PVOUTERSURF, SYSTEMSOUTH,
c SYSTEMWEST, SYSTEMTOP, SYSTEMBOTTOM, NPLowDEG, NPHIGHDEG)
*
      INTEGER SN, NUMSTPT1, NUMSTPT2, NUMSTPT3, PVOUTERSURF,
c SYSTEMSOUTH, SYSTEMWEST, SYSTEMTOP, SYSTEMBOTTOM,
c SURFCOUNT
*
      REAL EFPD, SURFVALUESPEC(500), NPLowDEG, NPHIGHDEG, A, PI
*
      CHARACTER SURFTYPESPEC(500)*2, PREFIX*3, CYCLE*2, SURFFILE*15,
c CHSTPT1*1, CHSTPT2*1, CHSTPT3*1

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 380 of 647

```

*
  PI=3.14159265359
*
input deck.
  SURFFILE(1:3)=PREFIX
  SURFFILE(4:4)='C'
  SURFFILE(5:6)=CYCLE
  SURFFILE(7:7)='T'
  NUMSTPT1=INT(EFPD/100.0)
  CHSTPT1=CHAR(NUMSTPT1+48)
  NUMSTPT2=INT((EFPD-(NUMSTPT1*100))/10.0)
  CHSTPT2=CHAR(NUMSTPT2+48)
  NUMSTPT3=INT(EFPD-(NUMSTPT1*100)-
c (NUMSTPT2*10))
  CHSTPT3=CHAR(NUMSTPT3+48)
  SURFFILE(8:8)=CHSTPT1
  SURFFILE(9:9)=CHSTPT2
  SURFFILE(10:10)=CHSTPT3
  SURFFILE(11:15)='.surf'
  OPEN(UNIT=40, FILE=SURFFILE, STATUS='UNKNOWN')
  REWIND(UNIT=40)
  WRITE(40,*)
  WRITE(40,10)
10 FORMAT(T1,'C  SURFACE SPECIFICATIONS')
  WRITE(40,20)
20 FORMAT(T1,'C')
  DO 70 SURFCOUNT=1, (SN-1)
    IF (SURFTYPESPEC(SURFCOUNT).NE.'P ') THEN
      IF ((SURFCOUNT.EQ.PVOUTERSURF).OR.
c (SURFCOUNT.EQ.SYSTEMSOUTH).OR.
c (SURFCOUNT.EQ.SYSTEMWEST).OR.
c (SURFCOUNT.EQ.SYSTEMTOP).OR.
c (SURFCOUNT.EQ.SYSTEMBOTTOM)) THEN
        WRITE(40,30) SURFCOUNT, SURFTYPESPEC(SURFCOUNT),
c SURFVALUESPEC(SURFCOUNT)
30 FORMAT(T1,I4,'*',T8,A2,T13,F11.6)
      ELSE
        WRITE(40,40) SURFCOUNT, SURFTYPESPEC(SURFCOUNT),
c SURFVALUESPEC(SURFCOUNT)
40 FORMAT(T1,I4,T8,A2,T13,F11.6)
      ENDIF
    ELSEIF (SURFTYPESPEC(SURFCOUNT).EQ.'P ') THEN
      IF ((SURFCOUNT.EQ.PVOUTERSURF).OR.
c (SURFCOUNT.EQ.SYSTEMSOUTH).OR.
c (SURFCOUNT.EQ.SYSTEMWEST).OR.
c (SURFCOUNT.EQ.SYSTEMTOP).OR.
c (SURFCOUNT.EQ.SYSTEMBOTTOM)) THEN
        WRITE(40,50) SURFCOUNT, SURFTYPESPEC(SURFCOUNT)
50 FORMAT(T1,I4,'*',T8,A2,T13,'1 -1 0 0')
      ELSEIF (SURFVALUESPEC(SURFCOUNT).EQ.8000) THEN
        NPLowDEG=NPLowDEG*(PI/180)
        A=1/(TAN(NPLowDEG))
        WRITE(40,60) SURFCOUNT, SURFTYPESPEC(SURFCOUNT), A
60 FORMAT(T1,I4,T8,A2,T13,F8.4,1X,'-1 0 0')

```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 381 of 647

```

      ELSEIF (SURFVALUESPEC(SURFCOUNT).EQ.8010) THEN
        NPHIGHDEG=NPHIGHDEG*(PI/180)
        A=1/(TAN(NPHIGHDEG))
        WRITE(40,80) SURFCOUNT, SURFTYPESPEC(SURFCOUNT), A
80      FORMAT(T1,I4,T8,A2,T13,F8.4,1X,'-1 0 0')
      ELSEIF (SURFVALUESPEC(SURFCOUNT).EQ.8020) THEN
        A=1/(TAN(NPLOWDEG))
        WRITE(40,90) SURFCOUNT, SURFTYPESPEC(SURFCOUNT), A
90      FORMAT(T1,I4,T8,A2,T13,F8.4,1X,'1 0 0')
      ELSEIF (SURFVALUESPEC(SURFCOUNT).EQ.8030) THEN
        A=1/(TAN(NPHIGHDEG))
        WRITE(40,100) SURFCOUNT, SURFTYPESPEC(SURFCOUNT), A
100     FORMAT(T1,I4,T8,A2,T13,F8.4,1X,'1 0 0')
      ENDIF
    ENDIF
70 CONTINUE
  CLOSE(UNIT=40)

  RETURN
  END

```

```

*****
*   This subroutine writes the control and initial source *
*   specification for this MCNP calculation.               *
*****
  SUBROUTINE CONTROL (NPERCYC, TOTCYCS, GARBCYCS,
c PITCH, ASSYPITCH, NUMOFNODES, NODEHEIGHT,
c BANDW, WESTINGHOUSE, CE, EIGHTH, QUARTER, FULL,
c PREFIX, CYCLE, EFPD, CONTFILE)
*
  INTEGER NUMOFNODES, COLUMN, ROW, NUMSTPT1, NUMSTPT2,
c NUMSTPT3, NODE
*
  INTEGER*4 NPERCYC, TOTCYCS, GARBCYCS
*
  REAL PITCH, ASSYPITCH, NODEHEIGHT(50), EFPD, TOTALHEIGHT,
c XVAL, YVAL, ZVAL, TH
*
  CHARACTER PREFIX*3, CYCLE*2, CHSTPT1*1,
c CHSTPT2*1, CHSTPT3*1, CONTFILE*15
*
  LOGICAL BANDW, WESTINGHOUSE, CE, EIGHTH, QUARTER, FULL
*
* Open the file to contain the control and source specifications.
  CONTFILE(1:3)=PREFIX
  CONTFILE(4:4)='C'
  CONTFILE(5:6)=CYCLE
  CONTFILE(7:7)='T'
  NUMSTPT1=INT(EFPD/100.0)
  CHSTPT1=CHAR(NUMSTPT1+48)
  NUMSTPT2=INT((EFPD-(NUMSTPT1*100))/10.0)
  CHSTPT2=CHAR(NUMSTPT2+48)
  NUMSTPT3=INT(EFPD-(NUMSTPT1*100)-
c (NUMSTPT2*10))

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 382 of 647

```

CHSTPT3=CHAR(NUMSTPT3+48)
CONTFIL(8:8)=CHSTPT1
CONTFIL(9:9)=CHSTPT2
CONTFIL(10:10)=CHSTPT3
CONTFIL(11:15)='.cont'
OPEN(UNIT=230, FILE=CONTFIL, STATUS='UNKNOWN')
REWIND(UNIT=230)
*
* Write the control card specifications
  WRITE(230,1)
  1 FORMAT(T1,'C')
  WRITE(230,2)
  2 FORMAT(T1,'C CONTROL CARD SPECIFICATIONS')
  WRITE(230,3)
  3 FORMAT(T1,'C')
  WRITE(230,10)
  10 FORMAT(T1,'MODE N')
  WRITE(230,20) NPERCYC, GARBCYCS, TOTCYCS
  20 FORMAT(T1,'KCODE ',I6,3X,'1.0',3X,I3,3X,I6)
*
* Write the source specifications
  WRITE(230,30)
  30 FORMAT(T1,'C')
  WRITE(230,40)
  40 FORMAT(T1,'C INITIAL SOURCE SPECIFICATIONS')
  WRITE(230,50)
  50 FORMAT(T1,'C')
  WRITE(230,60)
  60 FORMAT(T1,'KSRC',T8,$)
  TOTALHEIGHT=0.0
  DO 70 NODE=1,NUMOFNODES
    TOTALHEIGHT=TOTALHEIGHT+NODEHEIGHT(NODE)
  70 CONTINUE
  TH=TOTALHEIGHT
  IF ((BANDW.EQ..TRUE.).AND.(EIGHTH.EQ..TRUE.)) THEN
    DO 130 ROW=1,6
      IF (ROW.LE.3) THEN
        DO 90 COLUMN=ROW,8
          TH=TOTALHEIGHT
          DO 80 NODE=1,NUMOFNODES
            XVAL=((COLUMN-1)*ASSYPITCH)+PITCH
            YVAL=((ROW-1)*ASSYPITCH)+PITCH
            ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
            TH=TH-NODEHEIGHT(NODE)
            WRITE(230,72) XVAL, YVAL, ZVAL
          72 FORMAT(F7.3,' ',F7.3,' ',F7.3,' ',)$
            IF ((MOD(NODE,2).EQ.0).AND.
              c (NODE.NE.NUMOFNODES)) THEN
              WRITE(230,*)
              WRITE(230,75)
          75 FORMAT(T8,$)
            ENDIF
          IF (NODE.EQ.NUMOFNODES) THEN
            WRITE(230,*)

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 383 of 647

```
                WRITE(230,75)
                ENDIF
80                CONTINUE
90                CONTINUE
                ELSEIF ((ROW.GT.3).AND.(ROW.LE.5)) THEN
                DO 110 COLUMN=ROW,7
                TH=TOTALHEIGHT
                DO 100 NODE=1,NUMOFNODES
                XVAL=((COLUMN-1)*ASSYPITCH)+PITCH
                YVAL=((ROW-1)*ASSYPITCH)+PITCH
                ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                TH=TH-NODEHEIGHT(NODE)
                WRITE(230,92) XVAL, YVAL, ZVAL
92                FORMAT(F7.3,' ',F7.3,' ',F7.3,' ', '$)
                IF ((MOD(NODE,2).EQ.0).AND.
                c                (NODE.NE.NUMOFNODES)) THEN
                WRITE(230,*)
                WRITE(230,95)
95                FORMAT(T8,$)
                ENDIF
                IF (NODE.EQ.NUMOFNODES) THEN
                WRITE(230,*)
                WRITE(230,95)
                ENDIF
100                CONTINUE
110                CONTINUE
                ELSEIF (ROW.EQ.6) THEN
                DO 125 COLUMN=ROW,6
                TH=TOTALHEIGHT
                DO 120 NODE=1,NUMOFNODES
                XVAL=((COLUMN-1)*ASSYPITCH)+PITCH
                YVAL=((ROW-1)*ASSYPITCH)+PITCH
                ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                TH=TH-NODEHEIGHT(NODE)
                WRITE(230,112) XVAL, YVAL, ZVAL
112                FORMAT(F7.3,' ',F7.3,' ',F7.3,' ', '$)
                IF ((MOD(NODE,2).EQ.0).AND.
                c                (NODE.NE.NUMOFNODES)) THEN
                WRITE(230,*)
                WRITE(230,115)
115                FORMAT(T8,$)
                ENDIF
                IF (NODE.EQ.NUMOFNODES) THEN
                WRITE(230,*)
                ENDIF
120                CONTINUE
125                CONTINUE
                ENDIF
130                CONTINUE
                WRITE(230,132)
132                FORMAT(T1,'PRINT')
                WRITE(230,*)
                WRITE(230,*)
                ELSEIF ((BANDW.EQ..TRUE.).AND.(QUARTER.EQ..TRUE.)) THEN
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 384 of 647

```
DO 250 ROW=1,8
  IF (ROW.LE.3) THEN
    DO 160 COLUMN=1,8
      TH=TOTALHEIGHT
      DO 150 NODE=1,NUMOFNODES
        XVAL=((COLUMN-1)*ASSYPITCH)+PITCH
        YVAL=((ROW-1)*ASSYPITCH)+PITCH
        ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
        TH=TH-NODEHEIGHT(NODE)
        WRITE(230,142) XVAL, YVAL, ZVAL
142      FORMAT(F7.3,' ',F7.3,' ',F7.3,' ',,$)
        IF ((MOD(NODE,2).EQ.0).AND.
          c      (NODE.NE.NUMOFNODES)) THEN
          WRITE(230,*)
          WRITE(230,145)
145      FORMAT(T8,$)
        ENDIF
        IF (NODE.EQ.NUMOFNODES) THEN
          WRITE(230,*)
          WRITE(230,145)
        ENDIF
150      CONTINUE
160      CONTINUE
    ELSEIF ((ROW.GT.3).AND.(ROW.LE.5)) THEN
      DO 180 COLUMN=1,7
        TH=TOTALHEIGHT
        DO 170 NODE=1,NUMOFNODES
          XVAL=((COLUMN-1)*ASSYPITCH)+PITCH
          YVAL=((ROW-1)*ASSYPITCH)+PITCH
          ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
          TH=TH-NODEHEIGHT(NODE)
          WRITE(230,162) XVAL, YVAL, ZVAL
162      FORMAT(F7.3,' ',F7.3,' ',F7.3,' ',,$)
          IF ((MOD(NODE,2).EQ.0).AND.
            c      (NODE.NE.NUMOFNODES)) THEN
            WRITE(230,*)
            WRITE(230,165)
165      FORMAT(T8,$)
          ENDIF
          IF (NODE.EQ.NUMOFNODES) THEN
            WRITE(230,*)
            WRITE(230,165)
          ENDIF
170      CONTINUE
180      CONTINUE
    ELSEIF (ROW.EQ.6) THEN
      DO 200 COLUMN=1,6
        TH=TOTALHEIGHT
        DO 190 NODE=1,NUMOFNODES
          XVAL=((COLUMN-1)*ASSYPITCH)+PITCH
          YVAL=((ROW-1)*ASSYPITCH)+PITCH
          ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
          TH=TH-NODEHEIGHT(NODE)
          WRITE(230,182) XVAL, YVAL, ZVAL
```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 386 of 647

```
230          CONTINUE
240          CONTINUE
          ENDIF
250    CONTINUE
        WRITE(230,252)
252    FORMAT(T1,'PRINT')
        WRITE(230,*)
        WRITE(230,*)
        ELSEIF ((BANDW.EQ..TRUE.).AND.(FULL.EQ..TRUE.)) THEN
          DO 374 ROW=1,15
            IF (ROW.EQ.1) THEN
              DO 260 COLUMN=6,10
                TH=TOTALHEIGHT
                DO 258 NODE=1,NUMOFNODES
                  XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                  YVAL=(7*ASSYPITCH)+PITCH
                  ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                  TH=TH-NODEHEIGHT(NODE)
                WRITE(230,254) XVAL, YVAL, ZVAL
254          FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)
                  IF ((MOD(NODE,2).EQ.0).AND.
                    c (NODE.NE.NUMOFNODES)) THEN
                    WRITE(230,*)
                    WRITE(230,256)
256          FORMAT(T8,$)
                  ENDIF
                  IF (NODE.EQ.NUMOFNODES) THEN
                    WRITE(230,*)
                    WRITE(230,256)
                  ENDIF
                CONTINUE
258          CONTINUE
260          CONTINUE
          ELSEIF (ROW.EQ.2) THEN
            DO 268 COLUMN=4,12
              TH=TOTALHEIGHT
              DO 266 NODE=1,NUMOFNODES
                XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                YVAL=(6*ASSYPITCH)+PITCH
                ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                TH=TH-NODEHEIGHT(NODE)
                WRITE(230,262) XVAL, YVAL, ZVAL
262          FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)
                IF ((MOD(NODE,2).EQ.0).AND.
                    c (NODE.NE.NUMOFNODES)) THEN
                    WRITE(230,*)
                    WRITE(230,264)
264          FORMAT(T8,$)
                ENDIF
                IF (NODE.EQ.NUMOFNODES) THEN
                    WRITE(230,*)
                    WRITE(230,264)
                ENDIF
              CONTINUE
266          CONTINUE
268          CONTINUE
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 387 of 647

```
ELSEIF (ROW.EQ.3) THEN
  DO 276 COLUMN=3,13
    TH=TOTALHEIGHT
    DO 274 NODE=1,NUMOFNODES
      XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
      YVAL=(5*ASSYPITCH)+PITCH
      ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
      TH=TH-NODEHEIGHT(NODE)
      WRITE(230,270) XVAL, YVAL, ZVAL
270      FORMAT(F8.3,' ',F8.3,' ',F8.3,' ', '$)
      IF ((MOD(NODE,2).EQ.0).AND.
        c      (NODE.NE.NUMOFNODES)) THEN
          WRITE(230,*)
          WRITE(230,272)
272      FORMAT(T8,$)
        ENDIF
        IF (NODE.EQ.NUMOFNODES) THEN
          WRITE(230,*)
          WRITE(230,272)
        ENDIF
274      CONTINUE
276      CONTINUE
    ELSEIF (ROW.EQ.4) THEN
      DO 284 COLUMN=2,14
        TH=TOTALHEIGHT
        DO 282 NODE=1,NUMOFNODES
          XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
          YVAL=(4*ASSYPITCH)+PITCH
          ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
          TH=TH-NODEHEIGHT(NODE)
          WRITE(230,278) XVAL, YVAL, ZVAL
278      FORMAT(F8.3,' ',F8.3,' ',F8.3,' ', '$)
          IF ((MOD(NODE,2).EQ.0).AND.
            c          (NODE.NE.NUMOFNODES)) THEN
              WRITE(230,*)
              WRITE(230,280)
280      FORMAT(T8,$)
            ENDIF
            IF (NODE.EQ.NUMOFNODES) THEN
              WRITE(230,*)
              WRITE(230,280)
            ENDIF
282      CONTINUE
284      CONTINUE
        ELSEIF (ROW.EQ.5) THEN
          DO 292 COLUMN=2,14
            TH=TOTALHEIGHT
            DO 290 NODE=1,NUMOFNODES
              XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
              YVAL=(3*ASSYPITCH)+PITCH
              ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
              TH=TH-NODEHEIGHT(NODE)
              WRITE(230,286) XVAL, YVAL, ZVAL
286      FORMAT(F8.3,' ',F8.3,' ',F8.3,' ', '$)
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 388 of 647

```

      IF ((MOD(NODE,2).EQ.0).AND.
c      (NODE.NE.NUMOFNODES)) THEN
          WRITE(230,*)
          WRITE(230,288)
288      FORMAT(T8,$)
      ENDIF
      IF (NODE.EQ.NUMOFNODES) THEN
          WRITE(230,*)
          WRITE(230,288)
      ENDIF
290      CONTINUE
292      CONTINUE
      ELSEIF (ROW.EQ.6) THEN
          DO 300 COLUMN=1,15
              TH=TOTALHEIGHT
              DO 298 NODE=1,NUMOFNODES
                  XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                  YVAL=(2*ASSYPITCH)+PITCH
                  ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                  TH=TH-NODEHEIGHT(NODE)
                  WRITE(230,294) XVAL, YVAL, ZVAL
294      FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)
                  IF ((MOD(NODE,2).EQ.0).AND.
c                  (NODE.NE.NUMOFNODES)) THEN
                      WRITE(230,*)
                      WRITE(230,296)
296      FORMAT(T8,$)
                  ENDIF
                  IF (NODE.EQ.NUMOFNODES) THEN
                      WRITE(230,*)
                      WRITE(230,296)
                  ENDIF
298      CONTINUE
300      CONTINUE
          ELSEIF (ROW.EQ.7) THEN
              DO 308 COLUMN=1,15
                  TH=TOTALHEIGHT
                  DO 306 NODE=1,NUMOFNODES
                      XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                      YVAL=(1*ASSYPITCH)+PITCH
                      ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                      TH=TH-NODEHEIGHT(NODE)
                      WRITE(230,302) XVAL, YVAL, ZVAL
302      FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)
                      IF ((MOD(NODE,2).EQ.0).AND.
c                      (NODE.NE.NUMOFNODES)) THEN
                          WRITE(230,*)
                          WRITE(230,304)
304      FORMAT(T8,$)
                      ENDIF
                      IF (NODE.EQ.NUMOFNODES) THEN
                          WRITE(230,*)
                          WRITE(230,304)
                      ENDIF

```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 389 of 647

```
306          CONTINUE
308          CONTINUE
          ELSEIF (ROW.EQ.8) THEN
            DO 316 COLUMN=1,15
              TH=TOTALHEIGHT
              DO 314 NODE=1,NUMOFNODES
                XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                YVAL=(0*ASSYPITCH)+PITCH
                ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                TH=TH-NODEHEIGHT(NODE)
                WRITE(230,310) XVAL, YVAL, ZVAL
310          FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)
                IF ((MOD(NODE,2).EQ.0).AND.
312          (NODE.NE.NUMOFNODES)) THEN
                  WRITE(230,*)
                  WRITE(230,312)
                  FORMAT(T8,$)
                ENDIF
                IF (NODE.EQ.NUMOFNODES) THEN
                  WRITE(230,*)
                  WRITE(230,312)
                ENDIF
314          CONTINUE
316          CONTINUE
          ELSEIF (ROW.EQ.9) THEN
            DO 324 COLUMN=1,15
              TH=TOTALHEIGHT
              DO 322 NODE=1,NUMOFNODES
                XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                YVAL=(-1*ASSYPITCH)+PITCH
                ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                TH=TH-NODEHEIGHT(NODE)
                WRITE(230,318) XVAL, YVAL, ZVAL
318          FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)
                IF ((MOD(NODE,2).EQ.0).AND.
320          (NODE.NE.NUMOFNODES)) THEN
                  WRITE(230,*)
                  WRITE(230,320)
                  FORMAT(T8,$)
                ENDIF
                IF (NODE.EQ.NUMOFNODES) THEN
                  WRITE(230,*)
                  WRITE(230,320)
                ENDIF
322          CONTINUE
324          CONTINUE
          ELSEIF (ROW.EQ.10) THEN
            DO 332 COLUMN=1,15
              TH=TOTALHEIGHT
              DO 330 NODE=1,NUMOFNODES
                XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                YVAL=(-2*ASSYPITCH)+PITCH
                ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                TH=TH-NODEHEIGHT(NODE)
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 390 of 647

```

326          WRITE(230,326) XVAL, YVAL, ZVAL
          FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)
          IF ((MOD(NODE,2).EQ.0).AND.
c           (NODE.NE.NUMOFNODES)) THEN
              WRITE(230,*)
              WRITE(230,328)
328          FORMAT(T8,$)
          ENDIF
          IF (NODE.EQ.NUMOFNODES) THEN
              WRITE(230,*)
              WRITE(230,328)
          ENDIF
330          CONTINUE
332          CONTINUE
          ELSEIF (ROW.EQ.11) THEN
              DO 340 COLUMN=2,14
                  TH=TOTALHEIGHT
                  DO 338 NODE=1,NUMOFNODES
                      XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                      YVAL=(-3*ASSYPITCH)+PITCH
                      ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                      TH=TH-NODEHEIGHT(NODE)
                      WRITE(230,334) XVAL, YVAL, ZVAL
334          FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)
                      IF ((MOD(NODE,2).EQ.0).AND.
c                       (NODE.NE.NUMOFNODES)) THEN
                          WRITE(230,*)
                          WRITE(230,336)
336          FORMAT(T8,$)
                      ENDIF
                      IF (NODE.EQ.NUMOFNODES) THEN
                          WRITE(230,*)
                          WRITE(230,336)
                      ENDIF
338          CONTINUE
340          CONTINUE
          ELSEIF (ROW.EQ.12) THEN
              DO 348 COLUMN=2,14
                  TH=TOTALHEIGHT
                  DO 346 NODE=1,NUMOFNODES
                      XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                      YVAL=(-4*ASSYPITCH)+PITCH
                      ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                      TH=TH-NODEHEIGHT(NODE)
                      WRITE(230,342) XVAL, YVAL, ZVAL
342          FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)
                      IF ((MOD(NODE,2).EQ.0).AND.
c                       (NODE.NE.NUMOFNODES)) THEN
                          WRITE(230,*)
                          WRITE(230,344)
344          FORMAT(T8,$)
                      ENDIF
                      IF (NODE.EQ.NUMOFNODES) THEN
                          WRITE(230,*)

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 391 of 647

```
                WRITE(230,344)
                ENDIF
346             CONTINUE
348             CONTINUE
                ELSEIF (ROW.EQ.13) THEN
                DO 356 COLUMN=3,13
                TH=TOTALHEIGHT
                DO 354 NODE=1,NUMOFNODES
                XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                YVAL=(-5*ASSYPITCH)+PITCH
                ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                TH=TH-NODEHEIGHT(NODE)
                WRITE(230,350) XVAL, YVAL, ZVAL
350             FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)
                IF ((MOD(NODE,2).EQ.0).AND.
c                 (NODE.NE.NUMOFNODES)) THEN
                WRITE(230,*)
                WRITE(230,352)
352             FORMAT(T8,$)
                ENDIF
                IF (NODE.EQ.NUMOFNODES) THEN
                WRITE(230,*)
                WRITE(230,352)
                ENDIF
354             CONTINUE
356             CONTINUE
                ELSEIF (ROW.EQ.14) THEN
                DO 364 COLUMN=4,12
                TH=TOTALHEIGHT
                DO 362 NODE=1,NUMOFNODES
                XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                YVAL=(-6*ASSYPITCH)+PITCH
                ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                TH=TH-NODEHEIGHT(NODE)
                WRITE(230,358) XVAL, YVAL, ZVAL
358             FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)
                IF ((MOD(NODE,2).EQ.0).AND.
c                 (NODE.NE.NUMOFNODES)) THEN
                WRITE(230,*)
                WRITE(230,360)
360             FORMAT(T8,$)
                ENDIF
                IF (NODE.EQ.NUMOFNODES) THEN
                WRITE(230,*)
                WRITE(230,360)
                ENDIF
362             CONTINUE
364             CONTINUE
                ELSEIF (ROW.EQ.15) THEN
                DO 372 COLUMN=6,10
                TH=TOTALHEIGHT
                DO 370 NODE=1,NUMOFNODES
                XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                YVAL=(-7*ASSYPITCH)+PITCH
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 392 of 647

```

      ZVAL=TH- (NODEHEIGHT (NODE) /2.0)
      TH=TH-NODEHEIGHT (NODE)
      WRITE(230,366) XVAL, YVAL, ZVAL
366     FORMAT(F8.3, ' ', F8.3, ' ', F8.3, ' ', $)
      IF ((MOD(NODE,2).EQ.0).AND.
c      (NODE.NE.NUMOFNODES)) THEN
          WRITE(230,*)
          WRITE(230,368)
368     FORMAT(T8,$)
      ENDIF
      IF (NODE.EQ.NUMOFNODES) THEN
          WRITE(230,*)
      ENDIF
370     CONTINUE
372     CONTINUE
      ENDIF
374     CONTINUE
      WRITE(230,376)
376     FORMAT(T1, 'PRINT')
      WRITE(230,*)
      WRITE(230,*)
      ELSEIF ((WESTINGHOUSE.EQ..TRUE.).AND.
c      (EIGHTH.EQ..TRUE.)) THEN
          DO 460 ROW=1,6
              IF (ROW.LE.4) THEN
                  DO 410 COLUMN=ROW,8
                      TH=TOTALHEIGHT
                      DO 400 NODE=1,NUMOFNODES
                          XVAL=((COLUMN-1)*ASSYPITCH)+(2*PITCH)
                          YVAL=((ROW-1)*ASSYPITCH)+PITCH
                          ZVAL=TH- (NODEHEIGHT (NODE) /2.0)
                          TH=TH-NODEHEIGHT (NODE)
                          WRITE(230,380) XVAL, YVAL, ZVAL
380     FORMAT(F7.3, ' ', F7.3, ' ', F7.3, ' ', $)
                          IF ((MOD(NODE,2).EQ.0).AND.
c                          (NODE.NE.NUMOFNODES)) THEN
                              WRITE(230,*)
                              WRITE(230,390)
390     FORMAT(T8,$)
                          ENDIF
                          IF (NODE.EQ.NUMOFNODES) THEN
                              WRITE(230,*)
                              WRITE(230,390)
                          ENDIF
                      CONTINUE
                  CONTINUE
                  ELSEIF ((ROW.GT.4).AND.(ROW.LE.6)) THEN
                      DO 450 COLUMN=ROW,7
                          TH=TOTALHEIGHT
                          DO 440 NODE=1,NUMOFNODES
                              XVAL=((COLUMN-1)*ASSYPITCH)+(2*PITCH)
                              YVAL=((ROW-1)*ASSYPITCH)+PITCH
                              ZVAL=TH- (NODEHEIGHT (NODE) /2.0)
                              TH=TH-NODEHEIGHT (NODE)

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 393 of 647

```

      WRITE(230,420) XVAL, YVAL, ZVAL
420    FORMAT(F7.3, ' ', F7.3, ' ', F7.3, ' ', $)
      IF ((MOD(NODE,2).EQ.0).AND.
c      (NODE.NE.NUMOFNODES)) THEN
          WRITE(230,*)
          WRITE(230,430)
430    FORMAT(T8,$)
      ENDIF
      IF ((NODE.EQ.NUMOFNODES).AND.(ROW.LT.6)) THEN
          WRITE(230,*)
          WRITE(230,430)
          ELSEIF ((NODE.EQ.NUMOFNODES).AND.(ROW.EQ.6)) THEN
              WRITE(230,*)
          ENDIF
440    CONTINUE
450    CONTINUE
      ENDIF
460    CONTINUE
      WRITE(230,470)
470    FORMAT(T1,'PRINT')
      WRITE(230,*)
      WRITE(230,*)
      ELSEIF ((WESTINGHOUSE.EQ..TRUE.).AND.
c (QUARTER.EQ..TRUE.)) THEN
          DO 640 ROW=1,8
              IF (ROW.LE.4) THEN
                  DO 510 COLUMN=1,8
                      TH=TOTALHEIGHT
                      DO 500 NODE=1,NUMOFNODES
                          XVAL=((COLUMN-1)*ASSYPITCH)+PITCH
                          YVAL=((ROW-1)*ASSYPITCH)+PITCH
                          ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                          TH=TH-NODEHEIGHT(NODE)
                          WRITE(230,480) XVAL, YVAL, ZVAL
480    FORMAT(F7.3, ' ', F7.3, ' ', F7.3, ' ', $)
                          IF ((MOD(NODE,2).EQ.0).AND.
c                          (NODE.NE.NUMOFNODES)) THEN
                              WRITE(230,*)
                              WRITE(230,490)
490    FORMAT(T8,$)
                          ENDIF
                          IF (NODE.EQ.NUMOFNODES) THEN
                              WRITE(230,*)
                              WRITE(230,490)
                          ENDIF
500    CONTINUE
510    CONTINUE
          ELSEIF ((ROW.GT.4).AND.(ROW.LE.6)) THEN
              DO 550 COLUMN=1,7
                  TH=TOTALHEIGHT
                  DO 540 NODE=1,NUMOFNODES
                      XVAL=((COLUMN-1)*ASSYPITCH)+PITCH
                      YVAL=((ROW-1)*ASSYPITCH)+PITCH
                      ZVAL=TH-(NODEHEIGHT(NODE)/2.0)

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 394 of 647

```
TH=TH-NODEHEIGHT (NODE)
WRITE(230,520) XVAL, YVAL, ZVAL
520   FORMAT(F7.3, ' ', F7.3, ' ', F7.3, ' ', $)
      IF ((MOD(NODE,2).EQ.0).AND.
          (NODE.NE.NUMOFNODES)) THEN
          WRITE(230,*)
          WRITE(230,530)
530   FORMAT(T8,$)
      ENDIF
      IF (NODE.EQ.NUMOFNODES) THEN
          WRITE(230,*)
          WRITE(230,530)
      ENDIF
540   CONTINUE
550   CONTINUE
      ELSEIF (ROW.EQ.7) THEN
          DO 590 COLUMN=1,6
              TH=TOTALHEIGHT
              DO 580 NODE=1,NUMOFNODES
                  XVAL=((COLUMN-1)*ASSYPITCH)+PITCH
                  YVAL=((ROW-1)*ASSYPITCH)+PITCH
                  ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                  TH=TH-NODEHEIGHT(NODE)
                  WRITE(230,560) XVAL, YVAL, ZVAL
560   FORMAT(F7.3, ' ', F7.3, ' ', F7.3, ' ', $)
                  IF ((MOD(NODE,2).EQ.0).AND.
                      (NODE.NE.NUMOFNODES)) THEN
                      WRITE(230,*)
                      WRITE(230,570)
570   FORMAT(T8,$)
                  ENDIF
                  IF (NODE.EQ.NUMOFNODES) THEN
                      WRITE(230,*)
                      WRITE(230,570)
                  ENDIF
580   CONTINUE
590   CONTINUE
          ELSEIF (ROW.EQ.8) THEN
              DO 630 COLUMN=1,4
                  TH=TOTALHEIGHT
                  DO 620 NODE=1,NUMOFNODES
                      XVAL=((COLUMN-1)*ASSYPITCH)+PITCH
                      YVAL=((ROW-1)*ASSYPITCH)+PITCH
                      ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                      TH=TH-NODEHEIGHT(NODE)
                      WRITE(230,600) XVAL, YVAL, ZVAL
600   FORMAT(F7.3, ' ', F7.3, ' ', F7.3, ' ', $)
                      IF ((MOD(NODE,2).EQ.0).AND.
                          (NODE.NE.NUMOFNODES)) THEN
                          WRITE(230,*)
                          WRITE(230,610)
610   FORMAT(T8,$)
                      ENDIF
                      IF (NODE.EQ.NUMOFNODES) THEN
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 395 of 647

```

                WRITE(230,*)
                ENDIF
620             CONTINUE
630             CONTINUE
                ENDIF
640             CONTINUE
                WRITE(230,650)
650             FORMAT(T1,'PRINT')
                WRITE(230,*)
                WRITE(230,*)
                ELSEIF ((WESTINGHOUSE.EQ..TRUE.).AND.
c (FULL.EQ..TRUE.)) THEN
                DO 1020 ROW=1,15
                IF (ROW.EQ.1) THEN
                DO 690 COLUMN=5,11
                TH=TOTALHEIGHT
                DO 680 NODE=1,NUMOFNODES
                XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                YVAL=(7*ASSYPITCH)+PITCH
                ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                TH=TH-NODEHEIGHT(NODE)
                WRITE(230,660) XVAL, YVAL, ZVAL
660             FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)$
                IF ((MOD(NODE,2).EQ.0).AND.
c (NODE.NE.NUMOFNODES)) THEN
                WRITE(230,*)
                WRITE(230,670)
670             FORMAT(T8,$)
                ENDIF
                IF (NODE.EQ.NUMOFNODES) THEN
                WRITE(230,*)
                WRITE(230,670)
                ENDIF
680             CONTINUE
690             CONTINUE
                ELSEIF (ROW.EQ.2) THEN
                DO 730 COLUMN=3,13
                TH=TOTALHEIGHT
                DO 720 NODE=1,NUMOFNODES
                XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                YVAL=(6*ASSYPITCH)+PITCH
                ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                TH=TH-NODEHEIGHT(NODE)
                WRITE(230,700) XVAL, YVAL, ZVAL
700             FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)$
                IF ((MOD(NODE,2).EQ.0).AND.
c (NODE.NE.NUMOFNODES)) THEN
                WRITE(230,*)
                WRITE(230,710)
710             FORMAT(T8,$)
                ENDIF
                IF (NODE.EQ.NUMOFNODES) THEN
                WRITE(230,*)
                WRITE(230,710)

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 396 of 647

```

                                ENDIF
720      CONTINUE
730      CONTINUE
      ELSEIF (ROW.EQ.3) THEN
        DO 770 COLUMN=2,14
          TH=TOTALHEIGHT
          DO 760 NODE=1,NUMOFNODES
            XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
            YVAL=(5*ASSYPITCH)+PITCH
            ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
            TH=TH-NODEHEIGHT(NODE)
            WRITE(230,740) XVAL, YVAL, ZVAL
740      FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)
            IF ((MOD(NODE,2).EQ.0).AND.
              c      (NODE.NE.NUMOFNODES)) THEN
              WRITE(230,*)
              WRITE(230,750)
750      FORMAT(T8,$)
            ENDIF
            IF (NODE.EQ.NUMOFNODES) THEN
              WRITE(230,*)
              WRITE(230,750)
            ENDIF
760      CONTINUE
770      CONTINUE
      ELSEIF (ROW.EQ.4) THEN
        DO 810 COLUMN=2,14
          TH=TOTALHEIGHT
          DO 800 NODE=1,NUMOFNODES
            XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
            YVAL=(4*ASSYPITCH)+PITCH
            ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
            TH=TH-NODEHEIGHT(NODE)
            WRITE(230,780) XVAL, YVAL, ZVAL
780      FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',)
            IF ((MOD(NODE,2).EQ.0).AND.
              c      (NODE.NE.NUMOFNODES)) THEN
              WRITE(230,*)
              WRITE(230,790)
790      FORMAT(T8,$)
            ENDIF
            IF (NODE.EQ.NUMOFNODES) THEN
              WRITE(230,*)
              WRITE(230,790)
            ENDIF
800      CONTINUE
810      CONTINUE
      ELSEIF ((ROW.GE.5).AND.(ROW.LE.11)) THEN
        DO 850 COLUMN=1,15
          TH=TOTALHEIGHT
          DO 840 NODE=1,NUMOFNODES
            XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
            YVAL=(3*ASSYPITCH)+PITCH
            ZVAL=TH-(NODEHEIGHT(NODE)/2.0)

```


Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 397 of 647

```

      TH=TH-NODEHEIGHT (NODE)
      WRITE(230,820) XVAL, YVAL, ZVAL
820      FORMAT(F8.3, ' ', F8.3, ' ', F8.3, ' ', $)
      IF ((MOD(NODE,2).EQ.0).AND.
      c      (NODE.NE.NUMOFNODES)) THEN
          WRITE(230,*)
          WRITE(230,830)
830      FORMAT(T8,$)
      ENDIF
      IF (NODE.EQ.NUMOFNODES) THEN
          WRITE(230,*)
          WRITE(230,830)
      ENDIF
840      CONTINUE
850      CONTINUE
      ELSEIF (ROW.EQ.12) THEN
          DO 890 COLUMN=2,14
              TH=TOTALHEIGHT
              DO 880 NODE=1,NUMOFNODES
                  XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                  YVAL=(2*ASSYPITCH)+PITCH
                  ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                  TH=TH-NODEHEIGHT(NODE)
                  WRITE(230,860) XVAL, YVAL, ZVAL
860      FORMAT(F8.3, ' ', F8.3, ' ', F8.3, ' ', $)
                  IF ((MOD(NODE,2).EQ.0).AND.
                  c      (NODE.NE.NUMOFNODES)) THEN
                      WRITE(230,*)
                      WRITE(230,870)
870      FORMAT(T8,$)
                  ENDIF
                  IF (NODE.EQ.NUMOFNODES) THEN
                      WRITE(230,*)
                      WRITE(230,870)
                  ENDIF
880      CONTINUE
890      CONTINUE
          ELSEIF (ROW.EQ.13) THEN
              DO 930 COLUMN=2,14
                  TH=TOTALHEIGHT
                  DO 920 NODE=1,NUMOFNODES
                      XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                      YVAL=(1*ASSYPITCH)+PITCH
                      ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                      TH=TH-NODEHEIGHT(NODE)
                      WRITE(230,900) XVAL, YVAL, ZVAL
900      FORMAT(F8.3, ' ', F8.3, ' ', F8.3, ' ', $)
                      IF ((MOD(NODE,2).EQ.0).AND.
                      c      (NODE.NE.NUMOFNODES)) THEN
                          WRITE(230,*)
                          WRITE(230,910)
910      FORMAT(T8,$)
                      ENDIF
                      IF (NODE.EQ.NUMOFNODES) THEN
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 398 of 647

```

                WRITE(230,*)
                WRITE(230,910)
            ENDIF
920          CONTINUE
930          CONTINUE
            ELSEIF (ROW.EQ.14) THEN
                DO 970 COLUMN=3,13
                    TH=TOTALHEIGHT
                    DO 960 NODE=1,NUMOFNODES
                        XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                        YVAL=(0*ASSYPITCH)+PITCH
                        ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                        TH=TH-NODEHEIGHT(NODE)
                        WRITE(230,940) XVAL, YVAL, ZVAL
940          FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',,$)
                        IF ((MOD(NODE,2).EQ.0).AND.
c          (NODE.NE.NUMOFNODES)) THEN
                            WRITE(230,*)
                            WRITE(230,950)
950          FORMAT(T8,$)
                        ENDIF
                        IF (NODE.EQ.NUMOFNODES) THEN
                            WRITE(230,*)
                            WRITE(230,950)
                        ENDIF
960          CONTINUE
970          CONTINUE
            ELSEIF (ROW.EQ.15) THEN
                DO 1010 COLUMN=5,11
                    TH=TOTALHEIGHT
                    DO 1000 NODE=1,NUMOFNODES
                        XVAL=((COLUMN-8)*ASSYPITCH)+PITCH
                        YVAL=(-1*ASSYPITCH)+PITCH
                        ZVAL=TH-(NODEHEIGHT(NODE)/2.0)
                        TH=TH-NODEHEIGHT(NODE)
                        WRITE(230,980) XVAL, YVAL, ZVAL
980          FORMAT(F8.3,' ',F8.3,' ',F8.3,' ',,$)
                        IF ((MOD(NODE,2).EQ.0).AND.
c          (NODE.NE.NUMOFNODES)) THEN
                            WRITE(230,*)
                            WRITE(230,990)
990          FORMAT(T8,$)
                        ENDIF
                        IF (NODE.EQ.NUMOFNODES) THEN
                            WRITE(230,*)
                        ENDIF
1000         CONTINUE
1010         CONTINUE
            ENDIF
1020         CONTINUE
            WRITE(230,1030)
1030         FORMAT(T1,'PRINT')
            WRITE(230,*)
            WRITE(230,*)

```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 399 of 647

```

ELSEIF (CE.EQ..TRUE.) THEN
  WRITE(*,*) 'THE CE SOURCE SPECIFICATION IS',
c ' NOT AVAILABLE AT THIS TIME.'
ENDIF

RETURN
END

```

```

*****
*****

```

```

SUBROUTINE WESTONE(EIGHTH, QUARTER, FULL, ASSYID, NUMOFFADESIGNS,
c DESNUM, NUMOFBANKS, BANKDES, BANKID, BANKHEIGHT, BANKNUM,
c ENRICHMENT, STAT)
*
  INTEGER NUMOFFADESIGNS, DESNUM(50,50), NUMOFBANKS,
c BANKID(20), BANKNUM(50,50), C, R, BANK
*
  REAL BANKHEIGHT(20), ENRICHMENT(50,50)
*
  CHARACTER ASSYID(50,50)*5, STAT(50,50)*1, BANKDES(20)*5
*
  LOGICAL EIGHTH, QUARTER, FULL
*
  IF (EIGHTH.EQ..TRUE.) THEN
*   Read in the fuel assembly archive identifiers for retrieval of
isotopics.
    READ(15,10) ASSYID(1,1), ASSYID(2,1), ASSYID(3,1),
c ASSYID(4,1), ASSYID(5,1), ASSYID(6,1), ASSYID(7,1),
c ASSYID(8,1)
10   FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c A5,1X,A5)
    READ(15,20) ASSYID(2,2), ASSYID(3,2), ASSYID(4,2),
c ASSYID(5,2), ASSYID(6,2), ASSYID(7,2), ASSYID(8,2)
20   FORMAT(T1,5X,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c A5,1X,A5)
    READ(15,30) ASSYID(3,3), ASSYID(4,3), ASSYID(5,3),
c ASSYID(6,3), ASSYID(7,3), ASSYID(8,3)
30   FORMAT(T1,5X,1X,5X,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c A5,1X,A5)
    READ(15,40) ASSYID(4,4), ASSYID(5,4), ASSYID(6,4),
c ASSYID(7,4), ASSYID(8,4)
40   FORMAT(T1,5X,1X,5X,1X,5X,1X,A5,1X,A5,1X,A5,1X,A5,
c 1X,A5)
    READ(15,50) ASSYID(5,5), ASSYID(6,5), ASSYID(7,5)
50   FORMAT(T1,5X,1X,5X,1X,5X,1X,5X,1X,A5,1X,A5,1X,A5)
    READ(15,60) ASSYID(6,6), ASSYID(7,6)
60   FORMAT(T1,5X,1X,5X,1X,5X,1X,5X,1X,5X,1X,A5,1X,A5)
*   Read in the number of different fuel assembly designs to be included
*   in the MCNP calculation.
    READ(15,*) NUMOFFADESIGNS
*   Read in the fuel assembly relative design designations.
    READ(15,*) DESNUM(1,1), DESNUM(2,1), DESNUM(3,1),
c DESNUM(4,1), DESNUM(5,1), DESNUM(6,1), DESNUM(7,1),
c DESNUM(8,1)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00 Attachment I, Page 400 of 647

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      READ(15,*) DESNUM(2,2), DESNUM(3,2), DESNUM(4,2),
c      DESNUM(5,2), DESNUM(6,2), DESNUM(7,2), DESNUM(8,2)
      READ(15,*) DESNUM(3,3), DESNUM(4,3), DESNUM(5,3),
c      DESNUM(6,3), DESNUM(7,3), DESNUM(8,3)
      READ(15,*) DESNUM(4,4), DESNUM(5,4), DESNUM(6,4),
c      DESNUM(7,4), DESNUM(8,4)
      READ(15,*) DESNUM(5,5), DESNUM(6,5), DESNUM(7,5)
      READ(15,*) DESNUM(6,6), DESNUM(7,6)
      DO 80 C=1,50
        DO 70 R=1,50
          IF (DESNUM(C,R).GT.NUMOFFADESIGNS) THEN
            WRITE(*,*) 'THE FUEL ASSEMBLY DESIGN NUMBER ',
c            'SPECIFIED FOR THE ASSEMBLY IN RELATIVE POSITION ',
c            C,',',R,' IS LARGER THAN THE NUMBER OF FUEL ',
c            'ASSEMBLY DESIGNS SPECIFIED.'
            STOP
          ENDIF
        70      CONTINUE
      80      CONTINUE
*      Read in the number of different insertion rod assembly bank
designations and
*      bank insertion heights for the statepoint calculation. The insertion
height
*      values should be the distances (cm) between the bottom of the absorber
material
*      in the insertion rods and the bottom of the active fuel region.
      READ(15,*) NUMOFBANKS
      DO 100 BANK=1,NUMOFBANKS
        READ(15,90) BANKID(BANK), BANKDES(BANK),
c        BANKHEIGHT(BANK)
      90      FORMAT(T1,I2,1X,A5,1X,F7.3)
      100     CONTINUE
*      Read in the insertion rod assembly core layout.
      READ(15,*) BANKNUM(1,1), BANKNUM(2,1), BANKNUM(3,1),
c      BANKNUM(4,1), BANKNUM(5,1), BANKNUM(6,1), BANKNUM(7,1),
c      BANKNUM(8,1)
      READ(15,*) BANKNUM(2,2), BANKNUM(3,2), BANKNUM(4,2),
c      BANKNUM(5,2), BANKNUM(6,2), BANKNUM(7,2), BANKNUM(8,2)
      READ(15,*) BANKNUM(3,3), BANKNUM(4,3), BANKNUM(5,3),
c      BANKNUM(6,3), BANKNUM(7,3), BANKNUM(8,3)
      READ(15,*) BANKNUM(4,4), BANKNUM(5,4), BANKNUM(6,4),
c      BANKNUM(7,4), BANKNUM(8,4)
      READ(15,*) BANKNUM(5,5), BANKNUM(6,5), BANKNUM(7,5)
      READ(15,*) BANKNUM(6,6), BANKNUM(7,6)
*      Read in initial enrichments.
      READ(15,*) ENRICHMENT(1,1), ENRICHMENT(2,1),
c      ENRICHMENT(3,1), ENRICHMENT(4,1), ENRICHMENT(5,1),
c      ENRICHMENT(6,1), ENRICHMENT(7,1), ENRICHMENT(8,1)
      READ(15,*) ENRICHMENT(2,2), ENRICHMENT(3,2),
c      ENRICHMENT(4,2), ENRICHMENT(5,2), ENRICHMENT(6,2),
c      ENRICHMENT(7,2), ENRICHMENT(8,2)
      READ(15,*) ENRICHMENT(3,3), ENRICHMENT(4,3),
c      ENRICHMENT(5,3), ENRICHMENT(6,3), ENRICHMENT(7,3),
c      ENRICHMENT(8,3)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 401 of 647

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      READ(15,*) ENRICHMENT(4,4), ENRICHMENT(5,4),
c      ENRICHMENT(6,4), ENRICHMENT(7,4), ENRICHMENT(8,4)
      READ(15,*) ENRICHMENT(5,5), ENRICHMENT(6,5),
c      ENRICHMENT(7,5)
      READ(15,*) ENRICHMENT(6,6), ENRICHMENT(7,6)
*      Read in fuel status (fresh or burned).
      READ(15,101) STAT(1,1), STAT(2,1),
c      STAT(3,1), STAT(4,1), STAT(5,1),
c      STAT(6,1), STAT(7,1), STAT(8,1)
101     FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,102) STAT(2,2), STAT(3,2),
c      STAT(4,2), STAT(5,2), STAT(6,2),
c      STAT(7,2), STAT(8,2)
102     FORMAT(T3,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,103) STAT(3,3), STAT(4,3),
c      STAT(5,3), STAT(6,3), STAT(7,3),
c      STAT(8,3)
103     FORMAT(T5,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,104) STAT(4,4), STAT(5,4),
c      STAT(6,4), STAT(7,4), STAT(8,4)
104     FORMAT(T7,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,105) STAT(5,5), STAT(6,5),
c      STAT(7,5)
105     FORMAT(T9,A1,1X,A1,1X,A1)
      READ(15,106) STAT(6,6), STAT(7,6)
106     FORMAT(T11,A1,1X,A1)
      ELSEIF (QUARTER.EQ..TRUE.) THEN
*      Read in the fuel assembly archive identifiers for retrieval of
isotopics.
      READ(15,110) ASSYID(1,1), ASSYID(2,1), ASSYID(3,1),
c      ASSYID(4,1), ASSYID(5,1), ASSYID(6,1), ASSYID(7,1),
c      ASSYID(8,1)
110     FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c      A5,1X,A5)
      READ(15,120) ASSYID(1,2), ASSYID(2,2), ASSYID(3,2),
c      ASSYID(4,2), ASSYID(5,2), ASSYID(6,2), ASSYID(7,2),
c      ASSYID(8,2)
120     FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c      A5,1X,A5)
      READ(15,130) ASSYID(1,3), ASSYID(2,3), ASSYID(3,3),
c      ASSYID(4,3), ASSYID(5,3), ASSYID(6,3), ASSYID(7,3),
c      ASSYID(8,3)
130     FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c      A5,1X,A5)
      READ(15,140) ASSYID(1,4), ASSYID(2,4), ASSYID(3,4),
c      ASSYID(4,4), ASSYID(5,4), ASSYID(6,4), ASSYID(7,4),
c      ASSYID(8,4)
140     FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,
c      1X,A5)
      READ(15,150) ASSYID(1,5), ASSYID(2,5), ASSYID(3,5),
c      ASSYID(4,5), ASSYID(5,5), ASSYID(6,5), ASSYID(7,5)
150     FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
      READ(15,160) ASSYID(1,6), ASSYID(2,6), ASSYID(3,6),
c      ASSYID(4,6), ASSYID(5,6), ASSYID(6,6), ASSYID(7,6)
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 402 of 647

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160      FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
      READ(15,170) ASSYID(1,7), ASSYID(2,7), ASSYID(3,7),
c      ASSYID(4,7), ASSYID(5,7), ASSYID(6,7)
170      FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
      READ(15,180) ASSYID(1,8), ASSYID(2,8), ASSYID(3,8),
c      ASSYID(4,8)
180      FORMAT(T1,A5,1X,A5,1X,A5,1X,A5)
*      Read in the number of different fuel assembly designs to be included
*      in the MCNP calculation.
      READ(15,*) NUMOFFADESIGNS
*      Read in the fuel assembly relative design designations.
      READ(15,*) DESNUM(1,1), DESNUM(2,1), DESNUM(3,1),
c      DESNUM(4,1), DESNUM(5,1), DESNUM(6,1), DESNUM(7,1),
c      DESNUM(8,1)
      READ(15,*) DESNUM(1,2), DESNUM(2,2), DESNUM(3,2),
c      DESNUM(4,2), DESNUM(5,2), DESNUM(6,2), DESNUM(7,2),
c      DESNUM(8,2)
      READ(15,*) DESNUM(1,3), DESNUM(2,3), DESNUM(3,3),
c      DESNUM(4,3), DESNUM(5,3), DESNUM(6,3), DESNUM(7,3),
c      DESNUM(8,3)
      READ(15,*) DESNUM(1,4), DESNUM(2,4), DESNUM(3,4),
c      DESNUM(4,4), DESNUM(5,4), DESNUM(6,4), DESNUM(7,4),
c      DESNUM(8,4)
      READ(15,*) DESNUM(1,5), DESNUM(2,5), DESNUM(3,5),
c      DESNUM(4,5), DESNUM(5,5), DESNUM(6,5), DESNUM(7,5)
      READ(15,*) DESNUM(1,6), DESNUM(2,6), DESNUM(3,6),
c      DESNUM(4,6), DESNUM(5,6), DESNUM(6,6), DESNUM(7,6)
      READ(15,*) DESNUM(1,7), DESNUM(2,7), DESNUM(3,7),
c      DESNUM(4,7), DESNUM(5,7), DESNUM(6,7)
      READ(15,*) DESNUM(1,8), DESNUM(2,8), DESNUM(3,8),
c      DESNUM(4,8)
      DO 200 C=1,50
        DO 190 R=1,50
          IF (DESNUM(C,R).GT.NUMOFFADESIGNS) THEN
            WRITE(*,*) 'THE FUEL ASSEMBLY DESIGN NUMBER ',
c            'SPECIFIED FOR THE ASSEMBLY IN RELATIVE POSITION ',
c            C,',',R,' IS LARGER THAN THE NUMBER OF FUEL ',
c            'ASSEMBLY DESIGNS SPECIFIED.'
            STOP
          ENDIF
190      CONTINUE
200      CONTINUE
*      Read in the number of different insertion rod assembly bank
designations and
*      bank insertion heights for the statepoint calculation.  The insertion
height
*      values should be the distances (cm) between the bottom of the absorber
material
*      in the insertion rods and the bottom of the active fuel region.
      READ(15,*) NUMOFBANKS
      DO 220 BANK=1,NUMOFBANKS
        READ(15,210) BANKID(BANK), BANKDES(BANK),
c      BANKHEIGHT(BANK)
210      FORMAT(T1,I2,1X,A5,1X,F7.3)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 403 of 647

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220      CONTINUE
*      Read in the insertion rod assembly core layout.
      READ(15,*) BANKNUM(1,1), BANKNUM(2,1), BANKNUM(3,1),
c      BANKNUM(4,1), BANKNUM(5,1), BANKNUM(6,1), BANKNUM(7,1),
c      BANKNUM(8,1)
      READ(15,*) BANKNUM(1,2), BANKNUM(2,2), BANKNUM(3,2),
c      BANKNUM(4,2), BANKNUM(5,2), BANKNUM(6,2), BANKNUM(7,2),
c      BANKNUM(8,2)
      READ(15,*) BANKNUM(1,3), BANKNUM(2,3), BANKNUM(3,3),
c      BANKNUM(4,3), BANKNUM(5,3), BANKNUM(6,3), BANKNUM(7,3),
c      BANKNUM(8,3)
      READ(15,*) BANKNUM(1,4), BANKNUM(2,4), BANKNUM(3,4),
c      BANKNUM(4,4), BANKNUM(5,4), BANKNUM(6,4),
c      BANKNUM(7,4), BANKNUM(8,4)
      READ(15,*) BANKNUM(1,5), BANKNUM(2,5), BANKNUM(3,5),
c      BANKNUM(4,5), BANKNUM(5,5), BANKNUM(6,5),
c      BANKNUM(7,5)
      READ(15,*) BANKNUM(1,6), BANKNUM(2,6), BANKNUM(3,6),
c      BANKNUM(4,6), BANKNUM(5,6), BANKNUM(6,6), BANKNUM(7,6)
      READ(15,*) BANKNUM(1,7), BANKNUM(2,7), BANKNUM(3,7),
c      BANKNUM(4,7), BANKNUM(5,7), BANKNUM(6,7)
      READ(15,*) BANKNUM(1,8), BANKNUM(2,8), BANKNUM(3,8),
c      BANKNUM(4,8)
*      Read in initial enrichments if it is a BOC or BOL case.
      READ(15,*) ENRICHMENT(1,1), ENRICHMENT(2,1),
c      ENRICHMENT(3,1), ENRICHMENT(4,1), ENRICHMENT(5,1),
c      ENRICHMENT(6,1), ENRICHMENT(7,1), ENRICHMENT(8,1)
      READ(15,*) ENRICHMENT(1,2), ENRICHMENT(2,2),
c      ENRICHMENT(3,2), ENRICHMENT(4,2), ENRICHMENT(5,2),
c      ENRICHMENT(6,2), ENRICHMENT(7,2), ENRICHMENT(8,2)
      READ(15,*) ENRICHMENT(1,3), ENRICHMENT(2,3),
c      ENRICHMENT(3,3), ENRICHMENT(4,3), ENRICHMENT(5,3),
c      ENRICHMENT(6,3), ENRICHMENT(7,3), ENRICHMENT(8,3)
      READ(15,*) ENRICHMENT(1,4), ENRICHMENT(2,4),
c      ENRICHMENT(3,4), ENRICHMENT(4,4), ENRICHMENT(5,4),
c      ENRICHMENT(6,4), ENRICHMENT(7,4), ENRICHMENT(8,4)
      READ(15,*) ENRICHMENT(1,5), ENRICHMENT(2,5),
c      ENRICHMENT(3,5), ENRICHMENT(4,5), ENRICHMENT(5,5),
c      ENRICHMENT(6,5), ENRICHMENT(7,5)
      READ(15,*) ENRICHMENT(1,6), ENRICHMENT(2,6),
c      ENRICHMENT(3,6), ENRICHMENT(4,6), ENRICHMENT(5,6),
c      ENRICHMENT(6,6), ENRICHMENT(7,6)
      READ(15,*) ENRICHMENT(1,7), ENRICHMENT(2,7),
c      ENRICHMENT(3,7), ENRICHMENT(4,7), ENRICHMENT(5,7),
c      ENRICHMENT(6,7)
      READ(15,*) ENRICHMENT(1,8), ENRICHMENT(2,8),
c      ENRICHMENT(3,8), ENRICHMENT(4,8)
*      Read in fuel status (fresh or burned).
      READ(15,221) STAT(1,1), STAT(2,1),
c      STAT(3,1), STAT(4,1), STAT(5,1),
c      STAT(6,1), STAT(7,1), STAT(8,1)
221      FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,222) STAT(1,2), STAT(2,2),
c      STAT(3,2), STAT(4,2), STAT(5,2),
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 404 of 647

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c      STAT(6,2), STAT(7,2), STAT(8,2)
222   FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,223) STAT(1,3), STAT(2,3),
c      STAT(3,3), STAT(4,3), STAT(5,3),
c      STAT(6,3), STAT(7,3), STAT(8,3)
223   FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,224) STAT(1,4), STAT(2,4),
c      STAT(3,4), STAT(4,4), STAT(5,4),
c      STAT(6,4), STAT(7,4), STAT(8,4)
224   FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,225) STAT(1,5), STAT(2,5),
c      STAT(3,5), STAT(4,5), STAT(5,5),
c      STAT(6,5), STAT(7,5)
225   FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,226) STAT(1,6), STAT(2,6),
c      STAT(3,6), STAT(4,6), STAT(5,6),
c      STAT(6,6), STAT(7,6)
226   FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,227) STAT(1,7), STAT(2,7),
c      STAT(3,7), STAT(4,7), STAT(5,7), STAT(6,7)
227   FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,228) STAT(1,8), STAT(2,8),
c      STAT(3,8), STAT(4,8)
228   FORMAT(T1,A1,1X,A1,1X,A1,1X,A1)
      ELSEIF (FULL.EQ.TRUE.) THEN
*      Read in the fuel assembly archive identifiers for retrieval of
isotopics.
      READ(15,230) ASSYID(5,1), ASSYID(6,1), ASSYID(7,1),
c      ASSYID(8,1), ASSYID(9,1), ASSYID(10,1), ASSYID(11,1)
230   FORMAT(T25,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
      READ(15,240) ASSYID(3,2), ASSYID(4,2), ASSYID(5,2),
c      ASSYID(6,2), ASSYID(7,2), ASSYID(8,2), ASSYID(9,2),
c      ASSYID(10,2), ASSYID(11,2), ASSYID(12,2), ASSYID(13,2)
240   FORMAT(T13,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c      A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
      READ(15,250) ASSYID(2,3), ASSYID(3,3), ASSYID(4,3),
c      ASSYID(5,3), ASSYID(6,3), ASSYID(7,3), ASSYID(8,3),
c      ASSYID(9,3), ASSYID(10,3), ASSYID(11,3), ASSYID(12,3),
c      ASSYID(13,3), ASSYID(14,3)
250   FORMAT(T7,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c      A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
      READ(15,260) ASSYID(2,4), ASSYID(3,4), ASSYID(4,4),
c      ASSYID(5,4), ASSYID(6,4), ASSYID(7,4), ASSYID(8,4),
c      ASSYID(9,4), ASSYID(10,4), ASSYID(11,4), ASSYID(12,4),
c      ASSYID(13,4), ASSYID(14,4)
260   FORMAT(T7,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c      A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
      READ(15,270) ASSYID(1,5), ASSYID(2,5), ASSYID(3,5),
c      ASSYID(4,5), ASSYID(5,5), ASSYID(6,5), ASSYID(7,5),
c      ASSYID(8,5), ASSYID(9,5), ASSYID(10,5), ASSYID(11,5),
c      ASSYID(12,5), ASSYID(13,5), ASSYID(14,5), ASSYID(15,5)
270   FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c      A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
      READ(15,280) ASSYID(1,6), ASSYID(2,6), ASSYID(3,6),

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 405 of 647

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c    ASSYID(4,6), ASSYID(5,6), ASSYID(6,6), ASSYID(7,6),
c    ASSYID(8,6), ASSYID(9,6), ASSYID(10,6), ASSYID(11,6),
c    ASSYID(12,6), ASSYID(13,6), ASSYID(14,6), ASSYID(15,6)
280  FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c    A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
c    READ(15,290) ASSYID(1,7), ASSYID(2,7), ASSYID(3,7),
c    ASSYID(4,7), ASSYID(5,7), ASSYID(6,7), ASSYID(7,7),
c    ASSYID(8,7), ASSYID(9,7), ASSYID(10,7), ASSYID(11,7),
c    ASSYID(12,7), ASSYID(13,7), ASSYID(14,7), ASSYID(15,7)
290  FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c    A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
c    READ(15,300) ASSYID(1,8), ASSYID(2,8), ASSYID(3,8),
c    ASSYID(4,8), ASSYID(5,8), ASSYID(6,8), ASSYID(7,8),
c    ASSYID(8,8), ASSYID(9,8), ASSYID(10,8), ASSYID(11,8),
c    ASSYID(12,8), ASSYID(13,8), ASSYID(14,8), ASSYID(15,8)
300  FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c    A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
c    READ(15,310) ASSYID(1,9), ASSYID(2,9), ASSYID(3,9),
c    ASSYID(4,9), ASSYID(5,9), ASSYID(6,9), ASSYID(7,9),
c    ASSYID(8,9), ASSYID(9,9), ASSYID(10,9), ASSYID(11,9),
c    ASSYID(12,9), ASSYID(13,9), ASSYID(14,9), ASSYID(15,9)
310  FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c    A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
c    READ(15,320) ASSYID(1,10), ASSYID(2,10), ASSYID(3,10),
c    ASSYID(4,10), ASSYID(5,10), ASSYID(6,10), ASSYID(7,10),
c    ASSYID(8,10), ASSYID(9,10), ASSYID(10,10), ASSYID(11,10),
c    ASSYID(12,10), ASSYID(13,10), ASSYID(14,10), ASSYID(15,10)
320  FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c    A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
c    READ(15,330) ASSYID(1,11), ASSYID(2,11), ASSYID(3,11),
c    ASSYID(4,11), ASSYID(5,11), ASSYID(6,11), ASSYID(7,11),
c    ASSYID(8,11), ASSYID(9,11), ASSYID(10,11), ASSYID(11,11),
c    ASSYID(12,11), ASSYID(13,11), ASSYID(14,11), ASSYID(15,11)
330  FORMAT(T1,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c    A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
c    READ(15,340) ASSYID(2,12), ASSYID(3,12), ASSYID(4,12),
c    ASSYID(5,12), ASSYID(6,12), ASSYID(7,12), ASSYID(8,12),
c    ASSYID(9,12), ASSYID(10,12), ASSYID(11,12), ASSYID(12,12),
c    ASSYID(13,12), ASSYID(14,12)
340  FORMAT(T7,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c    A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
c    READ(15,350) ASSYID(2,13), ASSYID(3,13), ASSYID(4,13),
c    ASSYID(5,13), ASSYID(6,13), ASSYID(7,13), ASSYID(8,13),
c    ASSYID(9,13), ASSYID(10,13), ASSYID(11,13), ASSYID(12,13),
c    ASSYID(13,13), ASSYID(14,13)
350  FORMAT(T7,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c    A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
c    READ(15,360) ASSYID(3,14), ASSYID(4,14), ASSYID(5,14),
c    ASSYID(6,14), ASSYID(7,14), ASSYID(8,14), ASSYID(9,14),
c    ASSYID(10,14), ASSYID(11,14), ASSYID(12,14), ASSYID(13,14)
360  FORMAT(T13,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,
c    A5,1X,A5,1X,A5,1X,A5,1X,A5)
c    READ(15,370) ASSYID(5,15), ASSYID(6,15), ASSYID(7,15),
c    ASSYID(8,15), ASSYID(9,15), ASSYID(10,15), ASSYID(11,15)
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 406 of 647

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370      FORMAT(T25,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5,1X,A5)
*      Read in the number of different fuel assembly designs to be included
*      in the MCNP calculation.
      READ(15,*) NUMOFFADESIGNNS
*      Read in the fuel assembly relative design designations.
      READ(15,*) DESNUM(5,1), DESNUM(6,1), DESNUM(7,1),
c      DESNUM(8,1), DESNUM(9,1), DESNUM(10,1), DESNUM(11,1)
      READ(15,*) DESNUM(3,2), DESNUM(4,2), DESNUM(5,2),
c      DESNUM(6,2), DESNUM(7,2), DESNUM(8,2), DESNUM(9,2),
c      DESNUM(10,2), DESNUM(11,2), DESNUM(12,2), DESNUM(13,2)
      READ(15,*) DESNUM(2,3), DESNUM(3,3), DESNUM(4,3),
c      DESNUM(5,3), DESNUM(6,3), DESNUM(7,3), DESNUM(8,3),
c      DESNUM(9,3), DESNUM(10,3), DESNUM(11,3), DESNUM(12,3),
c      DESNUM(13,3), DESNUM(14,3)
      READ(15,*) DESNUM(2,4), DESNUM(3,4), DESNUM(4,4),
c      DESNUM(5,4), DESNUM(6,4), DESNUM(7,4), DESNUM(8,4),
c      DESNUM(9,4), DESNUM(10,4), DESNUM(11,4), DESNUM(12,4),
c      DESNUM(13,4), DESNUM(14,4)
      READ(15,*) DESNUM(1,5), DESNUM(2,5), DESNUM(3,5),
c      DESNUM(4,5), DESNUM(5,5), DESNUM(6,5), DESNUM(7,5),
c      DESNUM(8,5), DESNUM(9,5), DESNUM(10,5), DESNUM(11,5),
c      DESNUM(12,5), DESNUM(13,5), DESNUM(14,5), DESNUM(15,5)
      READ(15,*) DESNUM(1,6), DESNUM(2,6), DESNUM(3,6),
c      DESNUM(4,6), DESNUM(5,6), DESNUM(6,6), DESNUM(7,6),
c      DESNUM(8,6), DESNUM(9,6), DESNUM(10,6), DESNUM(11,6),
c      DESNUM(12,6), DESNUM(13,6), DESNUM(14,6), DESNUM(15,6)
      READ(15,*) DESNUM(1,7), DESNUM(2,7), DESNUM(3,7),
c      DESNUM(4,7), DESNUM(5,7), DESNUM(6,7), DESNUM(7,7),
c      DESNUM(8,7), DESNUM(9,7), DESNUM(10,7), DESNUM(11,7),
c      DESNUM(12,7), DESNUM(13,7), DESNUM(14,7), DESNUM(15,7)
      READ(15,*) DESNUM(1,8), DESNUM(2,8), DESNUM(3,8),
c      DESNUM(4,8), DESNUM(5,8), DESNUM(6,8), DESNUM(7,8),
c      DESNUM(8,8), DESNUM(9,8), DESNUM(10,8), DESNUM(11,8),
c      DESNUM(12,8), DESNUM(13,8), DESNUM(14,8), DESNUM(15,8)
      READ(15,*) DESNUM(1,9), DESNUM(2,9), DESNUM(3,9),
c      DESNUM(4,9), DESNUM(5,9), DESNUM(6,9), DESNUM(7,9),
c      DESNUM(8,9), DESNUM(9,9), DESNUM(10,9), DESNUM(11,9),
c      DESNUM(12,9), DESNUM(13,9), DESNUM(14,9), DESNUM(15,9)
      READ(15,*) DESNUM(1,10), DESNUM(2,10), DESNUM(3,10),
c      DESNUM(4,10), DESNUM(5,10), DESNUM(6,10), DESNUM(7,10),
c      DESNUM(8,10), DESNUM(9,10), DESNUM(10,10), DESNUM(11,10),
c      DESNUM(12,10), DESNUM(13,10), DESNUM(14,10), DESNUM(15,10)
      READ(15,*) DESNUM(1,11), DESNUM(2,11), DESNUM(3,11),
c      DESNUM(4,11), DESNUM(5,11), DESNUM(6,11), DESNUM(7,11),
c      DESNUM(8,11), DESNUM(9,11), DESNUM(10,11), DESNUM(11,11),
c      DESNUM(12,11), DESNUM(13,11), DESNUM(14,11), DESNUM(15,11)
      READ(15,*) DESNUM(2,12), DESNUM(3,12), DESNUM(4,12),
c      DESNUM(5,12), DESNUM(6,12), DESNUM(7,12), DESNUM(8,12),
c      DESNUM(9,12), DESNUM(10,12), DESNUM(11,12), DESNUM(12,12),
c      DESNUM(13,12), DESNUM(14,12)
      READ(15,*) DESNUM(2,13), DESNUM(3,13), DESNUM(4,13),
c      DESNUM(5,13), DESNUM(6,13), DESNUM(7,13), DESNUM(8,13),
c      DESNUM(9,13), DESNUM(10,13), DESNUM(11,13), DESNUM(12,13),
c      DESNUM(13,13), DESNUM(14,13)
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 407 of 647

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      READ(15,*) DESNUM(3,14), DESNUM(4,14), DESNUM(5,14),
c      DESNUM(6,14), DESNUM(7,14), DESNUM(8,14), DESNUM(9,14),
c      DESNUM(10,14), DESNUM(11,14), DESNUM(12,14), DESNUM(13,14)
      READ(15,*) DESNUM(5,15), DESNUM(6,15), DESNUM(7,15),
c      DESNUM(8,15), DESNUM(9,15), DESNUM(10,15), DESNUM(11,15)
      DO 390 C=1,50
        DO 380 R=1,50
          IF (DESNUM(C,R).GT.NUMOFFADESIGNS) THEN
            WRITE(*,*) 'THE FUEL ASSEMBLY DESIGN NUMBER ',
c            'SPECIFIED FOR THE ASSEMBLY IN POSITION ',
c            C,',',R,' IS LARGER THAN THE NUMBER OF FUEL ',
c            'ASSEMBLY DESIGNS SPECIFIED.'
            STOP
          ENDIF
        CONTINUE
      CONTINUE
*      Read in the number of different insertion rod assembly bank
designations and
*      bank insertion heights for the statepoint calculation.  The insertion
height
*      values should be the distances (cm) between the bottom of the absorber
material
*      in the insertion rods and the bottom of the active fuel region.
      READ(15,*) NUMOFBANKS
      DO 392 BANK=1,NUMOFBANKS
        READ(15,391) BANKID(BANK), BANKDES(BANK),
c        BANKHEIGHT(BANK)
      391      FORMAT(T1,I2,1X,A5,1X,F7.3)
      392      CONTINUE
*      Read in the insertion rod assembly core layout.
      READ(15,*) BANKNUM(5,1), BANKNUM(6,1), BANKNUM(7,1),
c      BANKNUM(8,1), BANKNUM(9,1), BANKNUM(10,1), BANKNUM(11,1)
      READ(15,*) BANKNUM(3,2), BANKNUM(4,2), BANKNUM(5,2),
c      BANKNUM(6,2), BANKNUM(7,2), BANKNUM(8,2), BANKNUM(9,2),
c      BANKNUM(10,2), BANKNUM(11,2), BANKNUM(12,2), BANKNUM(13,2)
      READ(15,*) BANKNUM(2,3), BANKNUM(3,3), BANKNUM(4,3),
c      BANKNUM(5,3), BANKNUM(6,3), BANKNUM(7,3), BANKNUM(8,3),
c      BANKNUM(9,3), BANKNUM(10,3), BANKNUM(11,3), BANKNUM(12,3),
c      BANKNUM(13,3), BANKNUM(14,3)
      READ(15,*) BANKNUM(2,4), BANKNUM(3,4), BANKNUM(4,4),
c      BANKNUM(5,4), BANKNUM(6,4), BANKNUM(7,4), BANKNUM(8,4),
c      BANKNUM(9,4), BANKNUM(10,4), BANKNUM(11,4), BANKNUM(12,4),
c      BANKNUM(13,4), BANKNUM(14,4)
      READ(15,*) BANKNUM(1,5), BANKNUM(2,5), BANKNUM(3,5),
c      BANKNUM(4,5), BANKNUM(5,5), BANKNUM(6,5), BANKNUM(7,5),
c      BANKNUM(8,5), BANKNUM(9,5), BANKNUM(10,5), BANKNUM(11,5),
c      BANKNUM(12,5), BANKNUM(13,5), BANKNUM(14,5), BANKNUM(15,5)
      READ(15,*) BANKNUM(1,6), BANKNUM(2,6), BANKNUM(3,6),
c      BANKNUM(4,6), BANKNUM(5,6), BANKNUM(6,6), BANKNUM(7,6),
c      BANKNUM(8,6), BANKNUM(9,6), BANKNUM(10,6), BANKNUM(11,6),
c      BANKNUM(12,6), BANKNUM(13,6), BANKNUM(14,6), BANKNUM(15,6)
      READ(15,*) BANKNUM(1,7), BANKNUM(2,7), BANKNUM(3,7),
c      BANKNUM(4,7), BANKNUM(5,7), BANKNUM(6,7), BANKNUM(7,7),
c      BANKNUM(8,7), BANKNUM(9,7), BANKNUM(10,7), BANKNUM(11,7),

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 408 of 647

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c   BANKNUM(12,7), BANKNUM(13,7), BANKNUM(14,7), BANKNUM(15,7)
    READ(15,*) BANKNUM(1,8), BANKNUM(2,8), BANKNUM(3,8),
c   BANKNUM(4,8), BANKNUM(5,8), BANKNUM(6,8), BANKNUM(7,8),
c   BANKNUM(8,8), BANKNUM(9,8), BANKNUM(10,8), BANKNUM(11,8),
c   BANKNUM(12,8), BANKNUM(13,8), BANKNUM(14,8), BANKNUM(15,8)
    READ(15,*) BANKNUM(1,9), BANKNUM(2,9), BANKNUM(3,9),
c   BANKNUM(4,9), BANKNUM(5,9), BANKNUM(6,9), BANKNUM(7,9),
c   BANKNUM(8,9), BANKNUM(9,9), BANKNUM(10,9), BANKNUM(11,9),
c   BANKNUM(12,9), BANKNUM(13,9), BANKNUM(14,9), BANKNUM(15,9)
    READ(15,*) BANKNUM(1,10), BANKNUM(2,10), BANKNUM(3,10),
c   BANKNUM(4,10), BANKNUM(5,10), BANKNUM(6,10), BANKNUM(7,10),
c   BANKNUM(8,10), BANKNUM(9,10), BANKNUM(10,10),
c   BANKNUM(11,10), BANKNUM(12,10), BANKNUM(13,10),
c   BANKNUM(14,10), BANKNUM(15,10)
    READ(15,*) BANKNUM(1,11), BANKNUM(2,11), BANKNUM(3,11),
c   BANKNUM(4,11), BANKNUM(5,11), BANKNUM(6,11), BANKNUM(7,11),
c   BANKNUM(8,11), BANKNUM(9,11), BANKNUM(10,11),
c   BANKNUM(11,11), BANKNUM(12,11), BANKNUM(13,11),
c   BANKNUM(14,11), BANKNUM(15,11)
    READ(15,*) BANKNUM(2,12), BANKNUM(3,12), BANKNUM(4,12),
c   BANKNUM(5,12), BANKNUM(6,12), BANKNUM(7,12), BANKNUM(8,12),
c   BANKNUM(9,12), BANKNUM(10,12), BANKNUM(11,12),
c   BANKNUM(12,12), BANKNUM(13,12), BANKNUM(14,12)
    READ(15,*) BANKNUM(2,13), BANKNUM(3,13), BANKNUM(4,13),
c   BANKNUM(5,13), BANKNUM(6,13), BANKNUM(7,13), BANKNUM(8,13),
c   BANKNUM(9,13), BANKNUM(10,13), BANKNUM(11,13),
c   BANKNUM(12,13), BANKNUM(13,13), BANKNUM(14,13)
    READ(15,*) BANKNUM(3,14), BANKNUM(4,14), BANKNUM(5,14),
c   BANKNUM(6,14), BANKNUM(7,14), BANKNUM(8,14), BANKNUM(9,14),
c   BANKNUM(10,14), BANKNUM(11,14), BANKNUM(12,14),
c   BANKNUM(13,14)
    READ(15,*) BANKNUM(5,15), BANKNUM(6,15), BANKNUM(7,15),
c   BANKNUM(8,15), BANKNUM(9,15), BANKNUM(10,15),
c   BANKNUM(11,15)

```

* Read in initial enrichments if it is a BOC or BOL case.

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    READ(15,*) ENRICHMENT(5,1), ENRICHMENT(6,1),
c   ENRICHMENT(7,1), ENRICHMENT(8,1), ENRICHMENT(9,1),
c   ENRICHMENT(10,1), ENRICHMENT(11,1)
    READ(15,*) ENRICHMENT(3,2), ENRICHMENT(4,2),
c   ENRICHMENT(5,2), ENRICHMENT(6,2), ENRICHMENT(7,2),
c   ENRICHMENT(8,2), ENRICHMENT(9,2), ENRICHMENT(10,2),
c   ENRICHMENT(11,2), ENRICHMENT(12,2), ENRICHMENT(13,2)
    READ(15,*) ENRICHMENT(2,3), ENRICHMENT(3,3),
c   ENRICHMENT(4,3), ENRICHMENT(5,3), ENRICHMENT(6,3),
c   ENRICHMENT(7,3), ENRICHMENT(8,3), ENRICHMENT(9,3),
c   ENRICHMENT(10,3), ENRICHMENT(11,3), ENRICHMENT(12,3),
c   ENRICHMENT(13,3), ENRICHMENT(14,3)
    READ(15,*) ENRICHMENT(2,4),
c   ENRICHMENT(3,4), ENRICHMENT(4,4), ENRICHMENT(5,4),
c   ENRICHMENT(6,4), ENRICHMENT(7,4), ENRICHMENT(8,4),
c   ENRICHMENT(9,4), ENRICHMENT(10,4), ENRICHMENT(11,4),
c   ENRICHMENT(12,4), ENRICHMENT(13,4), ENRICHMENT(14,4)
    READ(15,*) ENRICHMENT(1,5), ENRICHMENT(2,5),
c   ENRICHMENT(3,5),

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 409 of 647

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c      ENRICHMENT(4,5), ENRICHMENT(5,5), ENRICHMENT(6,5),
c      ENRICHMENT(7,5), ENRICHMENT(8,5), ENRICHMENT(9,5),
c      ENRICHMENT(10,5), ENRICHMENT(11,5), ENRICHMENT(12,5),
c      ENRICHMENT(13,5), ENRICHMENT(14,5), ENRICHMENT(15,5)
      READ(15,*) ENRICHMENT(1,6), ENRICHMENT(2,6),
c      ENRICHMENT(3,6), ENRICHMENT(4,6), ENRICHMENT(5,6),
c      ENRICHMENT(6,6), ENRICHMENT(7,6), ENRICHMENT(8,6),
c      ENRICHMENT(9,6), ENRICHMENT(10,6), ENRICHMENT(11,6),
c      ENRICHMENT(12,6), ENRICHMENT(13,6), ENRICHMENT(14,6),
c      ENRICHMENT(15,6)
      READ(15,*) ENRICHMENT(1,7), ENRICHMENT(2,7),
c      ENRICHMENT(3,7), ENRICHMENT(4,7), ENRICHMENT(5,7),
c      ENRICHMENT(6,7), ENRICHMENT(7,7), ENRICHMENT(8,7),
c      ENRICHMENT(9,7), ENRICHMENT(10,7), ENRICHMENT(11,7),
c      ENRICHMENT(12,7), ENRICHMENT(13,7), ENRICHMENT(14,7),
c      ENRICHMENT(15,7)
      READ(15,*) ENRICHMENT(1,8), ENRICHMENT(2,8),
c      ENRICHMENT(3,8), ENRICHMENT(4,8), ENRICHMENT(5,8),
c      ENRICHMENT(6,8), ENRICHMENT(7,8), ENRICHMENT(8,8),
c      ENRICHMENT(9,8), ENRICHMENT(10,8), ENRICHMENT(11,8),
c      ENRICHMENT(12,8), ENRICHMENT(13,8), ENRICHMENT(14,8),
c      ENRICHMENT(15,8)
      READ(15,*) ENRICHMENT(1,9), ENRICHMENT(2,9),
c      ENRICHMENT(3,9), ENRICHMENT(4,9), ENRICHMENT(5,9),
c      ENRICHMENT(6,9), ENRICHMENT(7,9), ENRICHMENT(8,9),
c      ENRICHMENT(9,9), ENRICHMENT(10,9), ENRICHMENT(11,9),
c      ENRICHMENT(12,9), ENRICHMENT(13,9), ENRICHMENT(14,9),
c      ENRICHMENT(15,9)
      READ(15,*) ENRICHMENT(1,10), ENRICHMENT(2,10),
c      ENRICHMENT(3,10), ENRICHMENT(4,10), ENRICHMENT(5,10),
c      ENRICHMENT(6,10), ENRICHMENT(7,10), ENRICHMENT(8,10),
c      ENRICHMENT(9,10), ENRICHMENT(10,10), ENRICHMENT(11,10),
c      ENRICHMENT(12,10), ENRICHMENT(13,10), ENRICHMENT(14,10),
c      ENRICHMENT(15,10)
      READ(15,*) ENRICHMENT(1,11), ENRICHMENT(2,11),
c      ENRICHMENT(3,11),
c      ENRICHMENT(4,11), ENRICHMENT(5,11), ENRICHMENT(6,11),
c      ENRICHMENT(7,11), ENRICHMENT(8,11), ENRICHMENT(9,11),
c      ENRICHMENT(10,11), ENRICHMENT(11,11), ENRICHMENT(12,11),
c      ENRICHMENT(13,11), ENRICHMENT(14,11), ENRICHMENT(15,11)
      READ(15,*) ENRICHMENT(2,12), ENRICHMENT(3,12),
c      ENRICHMENT(4,12), ENRICHMENT(5,12), ENRICHMENT(6,12),
c      ENRICHMENT(7,12), ENRICHMENT(8,12), ENRICHMENT(9,12),
c      ENRICHMENT(10,12), ENRICHMENT(11,12), ENRICHMENT(12,12),
c      ENRICHMENT(13,12), ENRICHMENT(14,12)
      READ(15,*) ENRICHMENT(2,13), ENRICHMENT(3,13),
c      ENRICHMENT(4,13),
c      ENRICHMENT(5,13), ENRICHMENT(6,13), ENRICHMENT(7,13),
c      ENRICHMENT(8,13), ENRICHMENT(9,13), ENRICHMENT(10,13),
c      ENRICHMENT(11,13), ENRICHMENT(12,13),
c      ENRICHMENT(13,13), ENRICHMENT(14,13)
      READ(15,*) ENRICHMENT(3,14), ENRICHMENT(4,14),
c      ENRICHMENT(5,14),
c      ENRICHMENT(6,14), ENRICHMENT(7,14), ENRICHMENT(8,14),
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 410 of 647

```
c      ENRICHMENT(9,14), ENRICHMENT(10,14), ENRICHMENT(11,14),
c      ENRICHMENT(12,14), ENRICHMENT(13,14)
      READ(15,*) ENRICHMENT(5,15), ENRICHMENT(6,15),
c      ENRICHMENT(7,15), ENRICHMENT(8,15), ENRICHMENT(9,15),
c      ENRICHMENT(10,15), ENRICHMENT(11,15)
*      Read in fuel status (fresh or burned).
      READ(15,393) STAT(5,1), STAT(6,1), STAT(7,1),
c      STAT(8,1), STAT(9,1), STAT(10,1), STAT(11,1)
393    FORMAT(T9,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,
c      1X,A1)
      READ(15,394) STAT(3,2), STAT(4,2), STAT(5,2),
c      STAT(6,2), STAT(7,2), STAT(8,2), STAT(9,2),
c      STAT(10,2), STAT(11,2), STAT(12,2), STAT(13,2)
394    FORMAT(T5,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,
c      A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,395) STAT(2,3), STAT(3,3), STAT(4,3),
c      STAT(5,3), STAT(6,3), STAT(7,3), STAT(8,3),
c      STAT(9,3), STAT(10,3), STAT(11,3), STAT(12,3),
c      STAT(13,3), STAT(14,3)
395    FORMAT(T3,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,
c      A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,396) STAT(2,4), STAT(3,4), STAT(4,4),
c      STAT(5,4), STAT(6,4), STAT(7,4), STAT(8,4),
c      STAT(9,4), STAT(10,4), STAT(11,4), STAT(12,4),
c      STAT(13,4), STAT(14,4)
396    FORMAT(T3,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,
c      1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,397) STAT(1,5), STAT(2,5), STAT(3,5),
c      STAT(4,5), STAT(5,5), STAT(6,5), STAT(7,5),
c      STAT(8,5), STAT(9,5), STAT(10,5), STAT(11,5),
c      STAT(12,5), STAT(13,5), STAT(14,5), STAT(15,5)
397    FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,
c      1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,398) STAT(1,6), STAT(2,6), STAT(3,6),
c      STAT(4,6), STAT(5,6), STAT(6,6), STAT(7,6),
c      STAT(8,6), STAT(9,6), STAT(10,6), STAT(11,6),
c      STAT(12,6), STAT(13,6), STAT(14,6), STAT(15,6)
398    FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,
c      1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,399) STAT(1,7), STAT(2,7), STAT(3,7),
c      STAT(4,7), STAT(5,7), STAT(6,7), STAT(7,7),
c      STAT(8,7), STAT(9,7), STAT(10,7), STAT(11,7),
c      STAT(12,7), STAT(13,7), STAT(14,7), STAT(15,7)
399    FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,
c      1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,400) STAT(1,8), STAT(2,8), STAT(3,8),
c      STAT(4,8), STAT(5,8), STAT(6,8), STAT(7,8),
c      STAT(8,8), STAT(9,8), STAT(10,8), STAT(11,8),
c      STAT(12,8), STAT(13,8), STAT(14,8), STAT(15,8)
400    FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,
c      1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,401) STAT(1,9), STAT(2,9), STAT(3,9),
c      STAT(4,9), STAT(5,9), STAT(6,9), STAT(7,9),
c      STAT(8,9), STAT(9,9), STAT(10,9), STAT(11,9),
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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 411 of 647

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c      STAT(12,9), STAT(13,9), STAT(14,9), STAT(15,9)
401   FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,
c      1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,402) STAT(1,10), STAT(2,10), STAT(3,10),
c      STAT(4,10), STAT(5,10), STAT(6,10), STAT(7,10),
c      STAT(8,10), STAT(9,10), STAT(10,10), STAT(11,10),
c      STAT(12,10), STAT(13,10), STAT(14,10), STAT(15,10)
402   FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,
c      1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,403) STAT(1,11), STAT(2,11), STAT(3,11),
c      STAT(4,11), STAT(5,11), STAT(6,11), STAT(7,11),
c      STAT(8,11), STAT(9,11), STAT(10,11), STAT(11,11),
c      STAT(12,11), STAT(13,11), STAT(14,11), STAT(15,11)
403   FORMAT(T1,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,
c      1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,404) STAT(2,12), STAT(3,12), STAT(4,12),
c      STAT(5,12), STAT(6,12), STAT(7,12), STAT(8,12),
c      STAT(9,12), STAT(10,12), STAT(11,12), STAT(12,12),
c      STAT(13,12), STAT(14,12)
404   FORMAT(T3,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,
c      1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,405) STAT(2,13), STAT(3,13), STAT(4,13),
c      STAT(5,13), STAT(6,13), STAT(7,13), STAT(8,13),
c      STAT(9,13), STAT(10,13), STAT(11,13), STAT(12,13),
c      STAT(13,13), STAT(14,13)
405   FORMAT(T3,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,
c      A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,406) STAT(3,14), STAT(4,14), STAT(5,14),
c      STAT(6,14), STAT(7,14), STAT(8,14), STAT(9,14),
c      STAT(10,14), STAT(11,14), STAT(12,14), STAT(13,14)
406   FORMAT(T5,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,
c      A1,1X,A1,1X,A1,1X,A1,1X,A1)
      READ(15,407) STAT(5,15), STAT(6,15), STAT(7,15),
c      STAT(8,15), STAT(9,15), STAT(10,15), STAT(11,15)
407   FORMAT(T9,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1,1X,A1)
      ENDIF
      RETURN
      END

```

```

*****
*****
*****
*****

```

```

SUBROUTINE WESTCRA(SPACERDIST, ENDFITHEIGHT, SURFVALUESPEC,
c CRADIM, CRABSMAT, CRABSWTS, CRUPLNMAT, CRUPLNWTS,
c CRLPLENMAT, CRLPLENWTS, GTDATA, LEFMAT,
c UEFMAT, MODDENSITY, REGABOVECRA, SPACERHEIGHT,
c HOMOSPACERDEN, MN, LN, CRAUNIV, BANKNUM, CRCLADMAT,
c CRCLADML, CRUPML, CRLPML, FRLEFML, FRUEFML, DESNUM,
c GTMAT, GTML, BMODML, NUMREGABOVECRA, SYSTEMTOP,
c FRUREGIONML, NUMOFSPACERS, HOMOSPACMLNUM, ASSYID,
c SURFTYPESPEC, CRABSZAIDS, BANKDES, CRUPZS, CRLPLENZAIDS,
c CRUNIQUE, HYBRID, SN, CRAXCLADML, GTAXML, NUMCRAXS,
c GTAXMAT, NUMOFGTAXS, CRAXCLADMAT, GTUNIV,

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 412 of 647

c CRABSAXWTS, CRAXDIM, GTAXDATA, CRABSAXMAT,
c CRABSAXZAIDS, GTSPLIT, NODEBOTTOMSURF)

*

INTEGER MN, LN, CRAUNIV(50,50), BANKNUM(50,50),
c CRCLADMAT(20),
c CRCLADML(50,50), CRUPML(50,50), CRLPML(50,50),
c FRLEFML(50,50), FRUEFML(50,50), DESNUM(50,50),
c GTMAT(20), GTML(50,50), BMODML, NUMREGABOVECRA,
c SYSTEMTOP,
c FRUREGIONML(50,50,20), NUMOFSPACERS(20),
c HOMOSPACMLNUM(20,15),
c ROW, COLUMN, CURRENTSURFLABEL, V, SN, UEFBOTTOMSURF,
c UEFTOPSURF, CRABSML, CRABSSURF, CRABSTOPSURF,
c CRABSBOTTOMSURF,
c CRCLADIRSURF, CRCLADORSURF, CRCLADTOPSURF,
c CRCLADBOTTOMSURF,
c C, RO, CO, GTTOPSURF, GTBOTSURF, GTORSURF, GTIRSURF,
c CRLEFTOPSURF, REGION, REGIONTOPSURF, REGIONBOTTOMSURF,
c SPN, SPACERTOPSURF, SPACERBOTTOMSURF,
c WATERREGIONTOPSURF,
c WATERREGIONBOTTOMSURF, HYBRID, CRAXABSSURF(5),
c CRAXABSTOPSURF(5), CRAXABSBOTTOMSURF(5),
c CRAXCLADIRSURF(5), CRAXCLADORSURF(5),
c CRAXCLADTOPSURF(5), CRAXCLADBOTTOMSURF(5),
c GTSECTBOTSURF(5), GTSECTTOPSURF(5),
c GTSECTORSURF(5), GTSECTIRSURF(5),
c CRAXCLADML(50,50,5), GTAXML(50,50,5), NUMCRAXS(20),
c GTAXMAT(20,5), NUMOFGTAXS(20), CRAXCLADMAT(20,20),
c GTUNIV(50,50), GTSPLIT, NODEBOTTOMSURF

*

REAL SPACERDIST(20,15), ENDFITHEIGHT(20,2),
c SURFVALUESPEC(500),
c CRADIM(20,7), CRABSMAT(20,2), CRABSWTS(20,35),
c CRUPLENMAT(20,2),
c CRUPLENWTS(20,35), CRLPLENMAT(20,2), CRLPLENWTS(20,35),
c GTDATA(20,4), LEFMAT(20,2),
c UEFMAT(20,2),
c MODDENSITY, REGABOVECRA(20,3), SPACERHEIGHT(20,15),
c HOMOSPACERDEN(20,15), CURRENTSURF, CLADRHO,
c SPACHEIGHT, CRABSAXWTS(20,35,20), CRAXDIM(20,5,20),
c GTAXDATA(20,4,5), CRABSAXMAT(20,2,20)

*

CHARACTER ASSYID(50,50)*5, SURFTYPESPEC(500)*2,
c CRABSZAIDS(20,35)*9, BANKDES(20)*5, CRUPZS(20,35)*9,
c CRLPLENZZAIDS(20,35)*9, CRABSAXZAIDS(20,35,20)*9

*

LOGICAL CRUNIQUE(50,50), CLADMLUNIQUE, LEAVE,
c CRUPMLUNIQUE, CRLPMLUNIQUE

*

* Write the specifications for the CR universes that are
* required to fill the assembly layout specifications previously defined.

DO 3730 ROW=1,50

DO 3720 COLUMN=1,50

*

* Write the CR universe specification for the assembly if it

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 413 of 647

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*      contains a unique CR material or unique CR position.
*
      IF (CRUNIQUE(COLUMN,ROW).EQ..TRUE.) THEN
* Write the CR specification header.
      WRITE(30,10)
10     FORMAT(T1,'C')
      WRITE(30,20) ASSYID(COLUMN,ROW)
20     FORMAT(T1,
c      'C CONTROL ROD UNIVERSE SPECIFICATION FOR ASSEMBLY ',A5)
      WRITE(30,30)
30     FORMAT(T1,'C')
* Define the upper end-fitting bottom surface.
      CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),1)+
c      ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
      CURRENTSURFLABEL=0
      DO 40 V=1,(SN-1)
          IF (SURFTYPESPEC(V).EQ.'PZ') THEN
IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
              CURRENTSURFLABEL=V
              EXIT
          ENDIF
      ENDIF
40     CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          UEFBOTTOMSURF=SN
          SURFTYPESPEC(SN)='PZ'
          SURFVALUESPEC(SN)=CURRENTSURF
          SN=SN+1
      ELSE
          UEFBOTTOMSURF=CURRENTSURFLABEL
      ENDIF
* Define the upper end-fitting top surface.
      CURRENTSURF=SPACERDIST(DESNUM(COLUMN,ROW),1)+
c      ENDFITHEIGHT(DESNUM(COLUMN,ROW),1)+
c      ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)
      CURRENTSURFLABEL=0
      DO 50 V=1,(SN-1)
          IF (SURFTYPESPEC(V).EQ.'PZ') THEN
IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
              CURRENTSURFLABEL=V
              EXIT
          ENDIF
      ENDIF
50     CONTINUE
      IF (CURRENTSURFLABEL.EQ.0) THEN
          UEFTOPSURF=SN
          SURFTYPESPEC(SN)='PZ'
          SURFVALUESPEC(SN)=CURRENTSURF
          SN=SN+1
      ELSE
          UEFTOPSURF=CURRENTSURFLABEL
      ENDIF
* Define the lower end-fitting top surface.
      CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 414 of 647

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CURRENTSURFLABEL=0
DO 60 V=1, (SN-1)
  IF (SURFTYPESPEC(V).EQ.'PZ') THEN
IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
  CURRENTSURFLABEL=V
  EXIT
  ENDIF
ENDIF
60 CONTINUE
IF (CURRENTSURFLABEL.EQ.0) THEN
  CRLEFTTOPSURF=SN
  SURFTYPESPEC(SN)='PZ'
  SURFVALUESPEC(SN)=CURRENTSURF
  SN=SN+1
ELSE
  CRLEFTTOPSURF=CURRENTSURFLABEL
ENDIF
* Loop through the regions above the CR (i.e. the appropriate upper core
regions)
* Define the upper region lower surface.
DO 100 REGION=1, NUMREGABOVECRA
* Determine the current upper region's lower surface specification.
  IF (REGION.EQ.1) THEN
    REGIONTOPSURF=SYSTEMTOP
    CURRENTSURF=SURFVALUESPEC(SYSTEMTOP)-
c    REGABOVECRA(REGION, 1)
  ENDIF
c    CURRENTSURF=SURFVALUESPEC(REGIONTOPSURF)-
REGABOVECRA(REGION, 1)
  IF (REGION.EQ.NUMREGABOVECRA) THEN
    REGIONBOTTOMSURF=UEFTOPSURF
  ELSE
    CURRENTSURFLABEL=0
    DO 70 V=1, (SN-1)
      IF (SURFTYPESPEC(V).EQ.'PZ') THEN
IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
        CURRENTSURFLABEL=V
        EXIT
      ENDIF
    ENDIF
70 CONTINUE
IF (CURRENTSURFLABEL.EQ.0) THEN
  REGIONBOTTOMSURF=SN
  SURFTYPESPEC(SN)='PZ'
  SURFVALUESPEC(SN)=CURRENTSURF
  SN=SN+1
ELSE
  REGIONBOTTOMSURF=CURRENTSURFLABEL
ENDIF
ENDIF
* Write the cell specification for the CR universe upper region.
  IF (REGION.EQ.1) THEN
    WRITE(30,80) LN, FRUREGIONML(COLUMN,ROW,REGION),
c    (-1*REGABOVECRA(REGION,2)),

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 416 of 647


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*       Define the CR and GT section surfaces
      IF ((HYBRID.EQ.1).AND.(GTSPLIT.EQ.1)) THEN
      DO 200 SECT=1,NUMCRAXS(BANKNUM(COLUMN,ROW))
*       Define the CR absorber radius.
              CURRENTSURF=CRAXDIM(BANKNUM(COLUMN,ROW),1,SECT)
              CURRENTSURFLABEL=0
              DO 110 V=1,(SN-1)
                  IF (SURFTYPESPEC(V).EQ.'CZ') THEN
                      IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                          CURRENTSURFLABEL=V
                          EXIT
                      ENDIF
                  ENDIF
          110 CONTINUE
                  IF (CURRENTSURFLABEL.EQ.0) THEN
                      CRAXBSSURF(SECT)=SN
                      SURFTYPESPEC(SN)='CZ'
                      SURFVALUESPEC(SN)=CURRENTSURF
                      SN=SN+1
                  ELSE
                      CRAXBSSURF(SECT)=CURRENTSURFLABEL
                  ENDIF
*       Define the CR absorber top surface.
              CURRENTSURF=ENDFITHEIGHT(DESNUM(COLUMN,ROW),2)+
c          CRAXDIM(BANKNUM(COLUMN,ROW),4,SECT)+
c          CRAXDIM(BANKNUM(COLUMN,ROW),5,SECT)
              IF (CURRENTSURF.GE.SURFVALUESPEC(ULEFTOPSURF)) THEN
                  CURRENTSURF=SURFVALUESPEC(ULEFTOPSURF)
              ENDIF
              CURRENTSURFLABEL=0
              DO 120 V=1,(SN-1)
                  IF (SURFTYPESPEC(V).EQ.'PZ') THEN
                      IF (ABS(SURFVALUESPEC(V)-CURRENTSURF).LT.(0.0001)) THEN
                          CURRENTSURFLABEL=V
                          EXIT
                      ENDIF
                  ENDIF
              ENDIF
```

Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 417 of 647

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                ENDIF
                ENDIF
120            CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    CRAXABSTOPSURF (SECT)=SN
                    SURFTYPESPEC (SN)='PZ'
                    SURFVALUESPEC (SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    CRAXABSTOPSURF (SECT)=CURRENTSURFLABEL
                ENDIF
*           Define the CR absorber bottom surface.
                CURRENTSURF=ENDFITHEIGHT (DESNUM (COLUMN,ROW) , 2) +
c           CRAXDIM (BANKNUM (COLUMN,ROW) , 4, SECT)
                IF (CURRENTSURF.GE.SURFVALUESPEC (UEFTOPSURF)) THEN
                    CURRENTSURF=SURFVALUESPEC (UEFTOPSURF)
                ENDIF
                CURRENTSURFLABEL=0
                DO 130 V=1, (SN-1)
                    IF (SURFTYPESPEC (V).EQ.'PZ') THEN
                IF (ABS (SURFVALUESPEC (V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
130            CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    CRAXABSBOTTOMSURF (SECT)=SN
                    SURFTYPESPEC (SN)='PZ'
                    SURFVALUESPEC (SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    CRAXABSBOTTOMSURF (SECT)=CURRENTSURFLABEL
                ENDIF
*           Define the CR cladding inner radius.
                CURRENTSURF=CRAXDIM (BANKNUM (COLUMN,ROW) , 2, SECT)
                CURRENTSURFLABEL=0
                DO 140 V=1, (SN-1)
                    IF (SURFTYPESPEC (V).EQ.'CZ') THEN
                IF (ABS (SURFVALUESPEC (V)-CURRENTSURF).LT.(0.0001)) THEN
                    CURRENTSURFLABEL=V
                    EXIT
                ENDIF
            ENDIF
140            CONTINUE
                IF (CURRENTSURFLABEL.EQ.0) THEN
                    CRAXCLADIRSURF (SECT)=SN
                    SURFTYPESPEC (SN)='CZ'
                    SURFVALUESPEC (SN)=CURRENTSURF
                    SN=SN+1
                ELSE
                    CRAXCLADIRSURF (SECT)=CURRENTSURFLABEL
                ENDIF
*           Define the CR cladding outer radius.

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Title: CRC Reactivity Calculations for McGuire Unit 1

Document Identifier: B00000000-01717-0210-00004 REV 00

Attachment I, Page 418 of 647

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CURRENTSURF=CRAXDIM (BANKNUM (COLUMN, ROW) , 3, SECT)
CURRENTSURFLABEL=0
DO 150 V=1, (SN-1)
  IF (SURFTYPESPEC (V) .EQ. 'CZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
  CURRENTSURFLABEL=V
  EXIT
  ENDIF
ENDIF
CONTINUE
150 IF (CURRENTSURFLABEL .EQ. 0) THEN
  CRAXCLADORSURF (SECT) =SN
  SURFTYPESPEC (SN) = 'CZ'
  SURFVALUESPEC (SN) =CURRENTSURF
  SN=SN+1
ELSE
  CRAXCLADORSURF (SECT) =CURRENTSURFLABEL
ENDIF
TOPSECT=1
DO 160 C=2, NUMCRAXS (BANKNUM (COLUMN, ROW) )
  IF (SURFVALUESPEC (CRAXCLADTOPSURF (C)) .GT.
c SURFVALUESPEC (CRAXCLADTOPSURF (TOPSECT))) THEN
  TOPSECT=C
ENDIF
160 CONTINUE
* Define the CR cladding top surface.
  IF (SECT .EQ. TOPSECT) THEN
c CURRENTSURF=CRAXDIM (BANKNUM (COLUMN, ROW) , 4, SECT) +
c CRAXDIM (BANKNUM (COLUMN, ROW) , 5, SECT) +
c ENDFITHEIGHT (DESNUM (COLUMN, ROW) , 2) +
c CRADIM (BANKNUM (COLUMN, ROW) , 7)
  ELSE
c CURRENTSURF=CRAXDIM (BANKNUM (COLUMN, ROW) , 4, SECT) +
c CRAXDIM (BANKNUM (COLUMN, ROW) , 5, SECT) +
c ENDFITHEIGHT (DESNUM (COLUMN, ROW) , 2)
  ENDIF
  IF (CURRENTSURF .GE. SURFVALUESPEC (UEFTOPSURF)) THEN
    CURRENTSURF=SURFVALUESPEC (UEFTOPSURF)
  ENDIF
  CURRENTSURFLABEL=0
  DO 170 V=1, (SN-1)
    IF (SURFTYPESPEC (V) .EQ. 'PZ') THEN
IF (ABS (SURFVALUESPEC (V) -CURRENTSURF) .LT. (0.0001)) THEN
  CURRENTSURFLABEL=V
  EXIT
  ENDIF
ENDIF
CONTINUE
170 IF (CURRENTSURFLABEL .EQ. 0) THEN
  CRAXCLADTOPSURF (SECT) =SN
  SURFTYPESPEC (SN) = 'PZ'
  SURFVALUESPEC (SN) =CURRENTSURF
  SN=SN+1
ELSE

```