NRC FORM 195 (2-76)

U.S. NUCLEAR REGULATORY COMMISS

DOCKET NUMBER 50-263

FILE NUMBER

## NRC DISTRIBUTION FOR PART 50 DOCKET MATERIAL

| | | |
|---|---|---|
| TO: Mr Stello | FROM: Northern States Pwr Co<br>Minneapolis, Mn<br>L O Mayer | DATE OF DOCUMENT 4-23-76<br>DATE RECEIVED 4-26-76 |

| | | | |
|---|---|---|---|
| ■ LETTER<br>■ ORIGINAL<br>☐ COPY<br>XX NOTORIZED<br>■ UNCLASSIFIED | PROP | INPUT FORM | NUMBER OF COPIES RECEIVED<br>one signed |

DESCRIPTION

Ltr notarized 3-23-76....trans the following in response to our 2-25-76 ltr.....

ENCLOSURE

Amdt to OL/Change to Tech Specs: Consisting of revision to tech specs with regard to adoption of standardized wording with regard to fuel rods sections of tech specs.....

(40 cys encl rec'd)

PLANT NAME: Monticello

| SAFETY | FOR ACTION/INFORMATION | ENVIRO 4-27-76 ehf |
|---|---|---|
| ASSIGNED AD : | | ASSIGNED AD : |
| BRANCH CHIEF : | Ziemann (5) | BRANCH CHIEF : |
| PROJECT MANAGER: | Snaider | PROJECT MANAGER : |
| LIC. ASST. : | Diggs | LIC. ASST. : |

INTERNAL DISTRIBUTION

| | | | |
|---|---|---|---|
| REG FILE | SYSTEMS SAFETY | PLANT SYSTEMS | ENVIRO TECH |
| NRC PDR | HEINEMAN | TEDESCO | ERNST |
| I & E (2) | SCHROEDER | BENAROYA | BALLARD |
| OELD | | LAINAS | SPANGLER |
| GOSSICK & STAFF | ENGINEERING | IPPOLITO | |
| MIPC | MACCARY | | SITE TECH |
| CASE | KNIGHT | OPERATING REACTORS | GAMMILL |
| HANAUER | SIHWEIL | STELLO | STEPP |
| HARLESS | PAWLICKI | | HULMAN |
| | | OPERATING TECH | |
| PROJECT MANAGEMENT | REACTOR SAFETY | EISENHUT | SITE ANALYSIS |
| BOYD | ROSS | SHAO | VOLLMER |
| P. COLLINS | NOVAK | BAER | BUNCH |
| HOUSTON | ROSZTOCZY | SCHWENCER | J. COLLINS |
| PETERSON | CHECK | GRIMES | KREGER |
| MELTZ | | | |
| HELTEMES | AT & I | SITE SAFETY & ENVIRO | |
| SKOVHOLT | SALTZMAN | ANALYSIS | |
| | RUTBERG | DENTON & MULLER | |

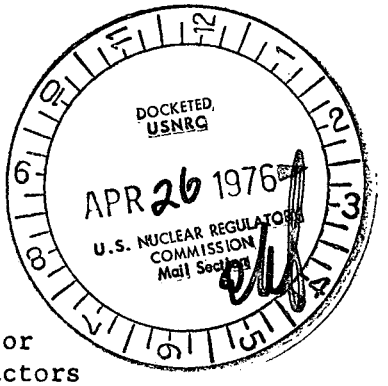
| EXTERNAL DISTRIBUTION | | | CONTROL NUMBER |
|---|---|---|---|
| LPDR: Minneapolis, Mn | NATL LAB | BROOKHAVEN NATL LAB | 4137 |
| TIC | REG. V-IE | ULRIKSON(ORNL) | |
| NSIC | LA PDR | | |
| ASLB | CONSULTANTS | | |
| ACRS 16 ~~HOLDING~~/SENT | TO LA Diggs | | |

NRC FORM 195 (2-76)

NSP

NORTHERN STATES POWER COMPANY

MINNEAPOLIS, MINNESOTA 55401





April 23, 1976

Mr. Victor Stello, Director
Division of Operating Reactors
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Stello:

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

License Amendment Request Dated April 23, 1976

Attached are 3 originals and 37 conformed copies of a request for change of the Technical Specifications, Appendix A of the Provisional Operating License for the Monticello Nuclear Generating Plant, Dated April 23, 1976. This request has been reviewed by the Monticello Operations Committee and the Safety Audit Committee.

This submittal is made in response to Mr. D.L. Ziemann's February 25, 1976 letter. It proposes changes to Technical Specifications 3.11/4.11, Fuel Rods, to adopt standardized wording.

Yours very truly,

L. O. Mayer

L. O. Mayer, PE
Manager, Nuclear Support Services

LOM/deb

cc: G. Charnoff
J. G. Keppler
MPCA - Attn: J.W. Ferman
MECCA - Attn: H.J. Vogel
City of St. Paul - Attn: D.L. Ficker
S. J. Gadler

4137

UNITED STATES NUCLEAR REGULATORY COMMISSION

NORTHERN STATES POWER COMPANY
MONTICELLO NUCLEAR GENERATING PLANT

Docket No. 50- 263

REQUEST FOR AMENDMENT TO
OPERATING LICENSE NO. DPR-22

(License Amendment Request Dated April 23, 1976)

Northern States Power Company, a Minnesota corporation, requests authorization for changes to the Technical Specifications as shown on the attachments labeled Exhibit A and Exhibit B. Exhibit A describes the proposed changes along with reasons for the change. Exhibit B is a set of Technical Specification pages incorporating the proposed changes.

This request contains no restricted or other defense information.

NORTHERN STATES POWER COMPANY

By L J Wachter
L J Wachter
Vice President, Power Production &
System Operation

On this 23rd day of April, 1976, before me a notary public in and for said County, personally appeared L J Wachter, Vice President, Power Production & System Operation, and first being duly sworn acknowledged that he is authorized to execute this document in behalf of Northern States Power Company, that he knows the contents thereof and that to the best of his knowledge, information and belief, the statements made in it are true and that it is not interposed for delay.

Denise E. Branau

DENISE E. BRANAU
NOTARY PUBLIC — MINNESOTA
HENNEPIN COUNTY
My Commission Expires Oct. 10, 1981

EXHIBIT A
MONTICELLO NUCLEAR GENERATING PLANT
DOCKET NO. 50-263

LICENSE AMENDMENT REQUEST DATED APRIL 23, 1976

PROPOSED CHANGES TO TECHNICAL SPECIFICATIONS
APPENDIX A OF PROVISIONAL OPERATING
LICENSE NO. DPR-22

Pursuant to 10 CFR 50.59, the holders of provisional operating license DPR-22 hereby propose the following changes to Appendix A Technical Specifications:

PROPOSED CHANGES

T.S. 3.11/4.11.A, B and C (Pages 189B, C and D)

Replace the current pages with those included in attached Exhibit B. Changes are indicated with sidelining. Note that the MCPR limits proposed are those submitted in the "License Amendment Request Dated December 1, 1975" which is expected to be issued imminently.

T.S. 3.11 and 4.11 Bases (Pages 189E, F and G)

Replace the current pages with those included in attached Exhibit B. Changes are indicated with sidelining.

Figures 3.11.1-A and E (Formerly Pages 189H and L)

Delete former Figure 3.11.1-A (page 189H) "MAPLHGR vs Planar Average Exposure, Monticello 7D225 Fuel". Change the number of former Figure 3.11.1-E (page 189L) "MAPLHGR vs Planar Average Exposure, Monticello 8D219 Fuel" to 3.11.1-A and shift it to page 189H.

Figure 3.11.2 (Page 189L)

Insert the new Figure 3.11.2, "LHGR vs Core Height", on the page 189L which was vacated by the above change.

Former Figure 3.11.2 (Page 189M)

Change the number of the figure entitled "$K_f$ Factor versus Percent of Rated Core Flow" from Figure 3.11.2 to Figure 3.11.3.

REASON FOR CHANGES

A February 25, 1976 letter from Mr D L Ziemann (USNRC) to Mr L O Mayer (NSP) requested that a standardized version of Specifications 3.11 and 4.11, Fuel Rods, be adopted. This submittal takes exception to the following aspects of the standard version:

1. The standard version specifies limiting conditions for operation on APLHGR, LHGR and MCPR which are applicable "during power operation". The limits specified are steady state values which are selected with sufficient margin such that they can safely be exceeded during operational transients. The requested changes clearly state that the LCO's apply to steady state operation.

2. The standard version references "normal surveillance" in specifying action to be taken. These words have been omitted because they are unnecessary, undefined and ambiguous.

3. It is proposed that the term "Operating MCPR Limit" continue to be embodied in specification 3.11.C of the Monticello Technical Specifications. The numerical limits are only listed in 3.11.C; all other references refer to the "Operating MCPR Limit". As MCPR limits change from one reload to another, the corresponding Technical Specification change can be made very simply. To remove this definition would needlessly complicate this and future changes.

4. The standard version of specification 4.11.C references "limiting control rod patterns" as an action level for initiating surveillance. This term, we understand, has recently been defined in the Standardized Technical Specifications as "A limiting control rod pattern is a pattern which results in the core being on a thermal hydraulic limit; i.e., operating on a limiting value for APLHGR, LHGR or MCPR". The concept of a "limiting control rod pattern" used in the Monticello FSAR, Reload Safety Evaluations, Technical Specifications and other references is grossly different. The Monticello 3.3/4.3.B.5 Bases state "...during reactor operation with certain limiting control rod patterns, the withdrawal of a designated single control rod could result in one or more fuel rods with MCPR's below the Safety Limit (T.S.2.1.A). During use of such patterns, it is judged that testing of the RBM system prior to withdrawal of such rods to assure operability will assure that improper withdrawal does not occur". In summary, the STS definition pertains to an Operating Limit while the historical definition pertains to a Safety Limit. To avoid this point of confusion, the intent of the STS definition has been included in proposed specification 4.11.C without using the term "limiting control rod pattern".

5. The last two sentences of 3.11.A and B and the identical sentences of 3.11.C are proposed in the reversed order of the standardized version to correspond to the order in which the required action is to be taken.

SAFETY EVALUATION

This change was prompted by an effort of standardization and has only very remote implications on the safe operation of the plant. The thermal limits on fuel rods remain unchanged. Action levels have been more clearly defined. The Monticello

specifications were initially proposed based on a reasonable balance between surveillance requirements and reporting requirements. This change represents a slight shift toward increased reporting and decreased surveillance requirements. It will make the requirements of Monticello uniform with other similar reactors.

PROPOSED CHANGES

Table of Contents pages vii and viii

Replace the current pages with those included in Exhibit B. Changes are indicated with sidelining.

REASON FOR CHANGES

These changes incorporate the above revisions to the figures in section 3.11/4.11.

EXHIBIT B

LICENSE AMENDMENT REQUEST DATED APRIL 23, 1976

Exhibit B, attached, consists of the following revised pages of the Appendix A Technical Specifications which incorporate the proposed changes:

| Pages |
| --- |
| 189B |
| 189C |
| 189D |
| 189E |
| 189F |
| 189G |
| 189H |
| 189L |
| 189M |
| vii |
| viii |

| 3.0 LIMITING CONDITIONS FOR OPERATION | 4.0 SURVEILLANCE REQUIREMENTS |
|---|---|

## 3.11 REACTOR FUEL ASSEMBLIES

### Applicability

The Limiting Conditions for Operation associated with the fuel rods apply to those parameters which monitor the fuel rod operating conditions.

### Objective

The objective of the Limiting Conditions for Operation is to assure the performance of the fuel rods.

### Specifications

A. Average Planar Linear Heat Generation Rate (APLHGR)

During steady state power operation, the APLHGR for each type of fuel as a function of average planar exposure shall not exceed the limiting value shown in Figures 3.11.1. If at any time during operation it is determined that the limiting value for APLHGR is being exceeded, action shall be initiated within 15 minutes to restore operation to within the prescribed limits. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits. If the APLHGR is not returned to within the prescribed limits within two (2) hours, the reactor shall be brought to the Cold Shutdown condition within 36 hours.

## 4.11 REACTOR FUEL ASSEMBLIES

### Applicability

The Surveillance Requirements apply to the parameters which monitor the fuel rod operating conditions.

### Objective

The objective of the Surveillance Requirements is to specify the type and frequency of surveillance to be applied to the fuel rods.

### Specifications

A. Average Planar Linear Heat Generation Rate (APLHGR)

The APLHGR for each type of fuel as a function of average planar exposure shall be determined daily during reactor operation at $\geq$ 25% rated thermal power.

| 3.0 LIMITING CONDITIONS FOR OPERATION | 4.0 SURVEILLANCE REQUIREMENTS |
|---|---|
| B. Linear Heat Generation Rate (LHGR)<br><br>During steady state power operation, the LHGR as a function of core height shall not exceed the limiting value shown in Figure 3.11.2 If at any time during operation it is determined that the limiting value for LHGR is being exceeded, action shall be initiated within 15 minutes to restore operation to within the prescribed limits. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits. If the LHGR is not returned to within the prescribed limits within two (2) hours, the reactor shall be brought to the Cold Shutdown condition within 36 hours. | B. Linear Heat Generation Rate (LHGR)<br><br>The LHGR as a function of core height shall be checked daily during reactor operation at ≥25% of rated thermal power. |

| 3.0 LIMITING CONDITIONS FOR OPERATION | 4.0 SURVEILLANCE REQUIREMENTS |
|---|---|
| C. Minimum Critical Power Ratio (MCPR)<br><br>During steady state power operation, the Operating MCPR Limit shall be $\geq$ 1.38 for 8x8 fuel and $\geq$ 1.29 for 7x7 fuel at rated power and flow. If at any time during operation it is determined that the limiting value for MCPR is being exceeded, action shall be initiated within 15 minutes to restore operation to within the prescribed limits. Surveillance and corresponding action shall continue until reactor operation is within the prescribed limits. If the steady state MCPR is not returned to within the prescribed limits within two (2) hours, the reactor shall be brought to the Cold Shutdown condition within 36 hours. For core flows other than rated the Operating MCPR Limit shall be the above value times $K_f$ where $K_f$ is as shown in Figure 3.11.3. | C. Minimum Critical Power Ratio (MCPR)<br><br>MCPR shall be determined daily during reactor power operation at $\geq$ 25% rated thermal power and following any change in power level or distribution which has the potential of bringing the core to its MCPR limit. |

A. Average Planar Linear Heat Generation Rate (APLHGR)

This specification assures that the peak cladding temperature following the postulated design basis loss-of-coolant accident will not exceed the limit specified in the 10CFR50, Appendix K.

The peak cladding temperature following a postulated loss-of-coolant accident is primarily a function of the average heat generation rate of all the rods of a fuel assembly at any axial location and is only dependent secondarily on the rod to rod power distribution within an assembly. Since expected local variations in power distribution within a fuel assembly affect the calculated peak cladding temperature by less than $\pm$ 20°F relative to the peak temperature for a typical fuel design, the limit on the average linear heat generation rate is sufficient to assure that calculated temperatures are within the 10CFR50 Appendix K limit. The limiting value for APLHGR is given by this specification.

B. Local LHGR

This specification assures that the linear heat generation rate in any rod is less than the design linear heat generation if fuel pellet densification is postulated. The power spike penalty specified is based on the analysis presented in Section 3.2.1 of Reference 1 and in References 2 and 3, and assumes a linearly increasing variation and axial gaps between core bottom and top and assures with a 95% confidence, that no more than one fuel rod exceeds the design linear heat generation rate due to power spiking.

C. Minimum Critical Power Ratio (MCPR)

The ECCS evaluation presented in Reference 4 assumed the steady state MCPR prior to the postulated loss of coolant accident to be 1.18 for all fuel types. The Operating MCPR Limit of 1.38 for 8x8 fuel and 1.29 for 7x7 fuel is determined from the analysis of transients discussed in Bases Sections 2.1 and 2.3. By maintaining an operating MCPR above these limits, the Safety Limit of 1.06 (T.S.2.1.A) applicable to all fuel types is maintained in the event of the most limiting abnormal operational transient.

For operation with less than rated core flow the Operating MCPR Limit is adjusted by multiplying the above limit by $K_f$. Reference 5 discusses how the transient analysis done at rated conditions encompasses the reduced flow situation when the proper $K_f$ factor is applied.

References

1. "Fuel Densification Effects in General Electric Boiling Water Reactor Fuel," Supplements 6, 7, and 8, NEDM-10735, August, 1973.

2. Supplement 1 to Technical Report on Densification of General Electric Reactor Fuels, December 14, 1974 (USAEC Regulatory Staff)

3. Communication: V A Moore to I S Mitchell, "Modified GE Model for Fuel Densification," Docket 50-321, March 27, 1974.

4. "Monticello Nuclear Generating Plant Loss-Of-Coolant Accident Analysis Conformance with 10 CFR 50 Appendix K, August 1974," L O Mayer (NSP) to J F O'Leary, August 20, 1974.

5. "General Electric BWR Generic Reload Application for 8 x 8 Fuel," NEDO-20360, Revision 1, November, 1974.

Bases 4.11

The APLHGR, LHGR and MCPR shall be checked daily to determine if fuel burnup, or control rod movement have caused changes in power distribution. Since changes due to burnup are slow, and only a few control rods are removed daily, a daily check of power distribution is adequate. For a limiting value to occur below 25% of rated thermal power, an unreasonably large peaking factor would be required, which is not the case for operating control rod sequences. In addition, the MCPR is checked whenever changes in the core power level or distribution are made which have the potential of bringing the fuel rods to their thermal-hydraulic limits.

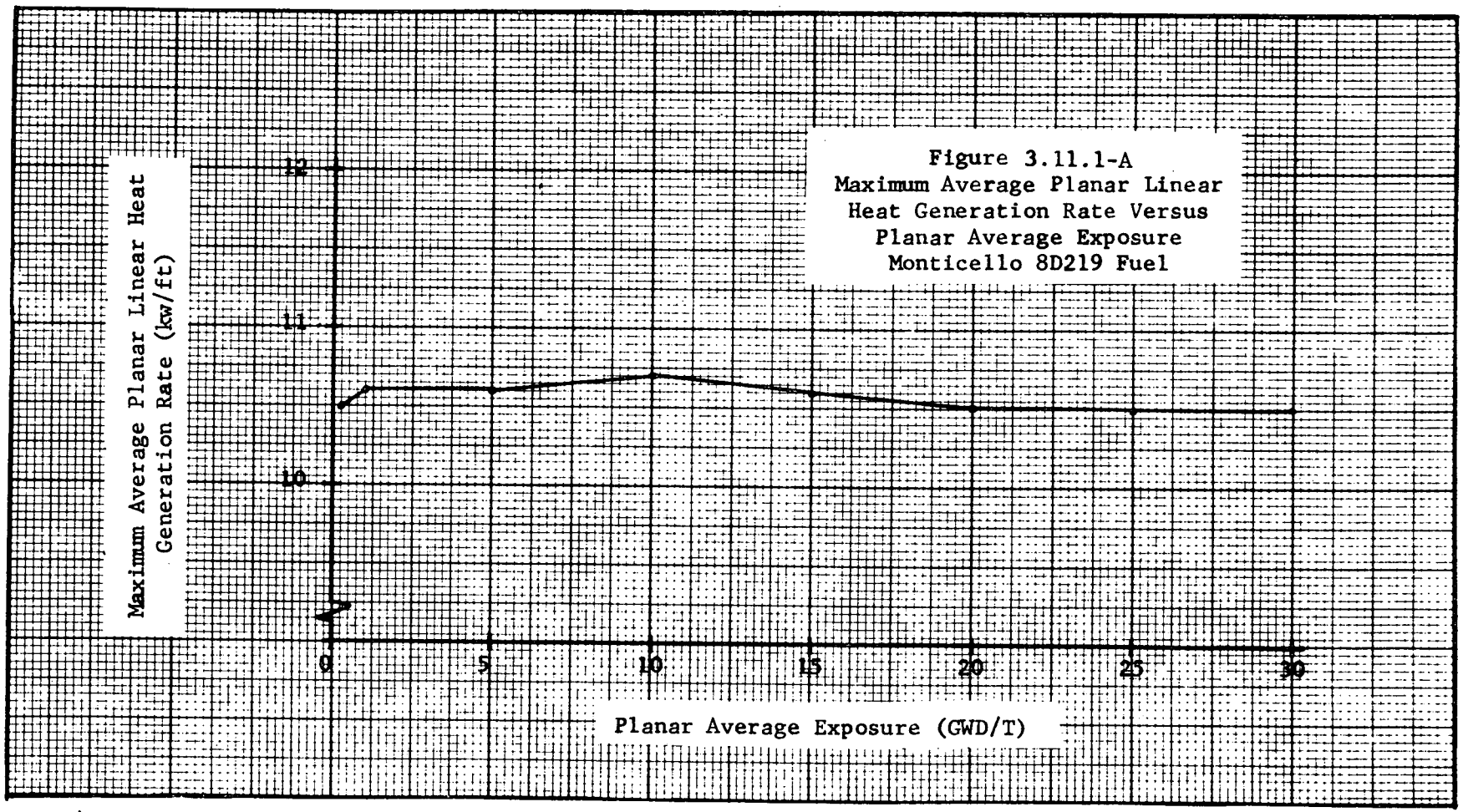
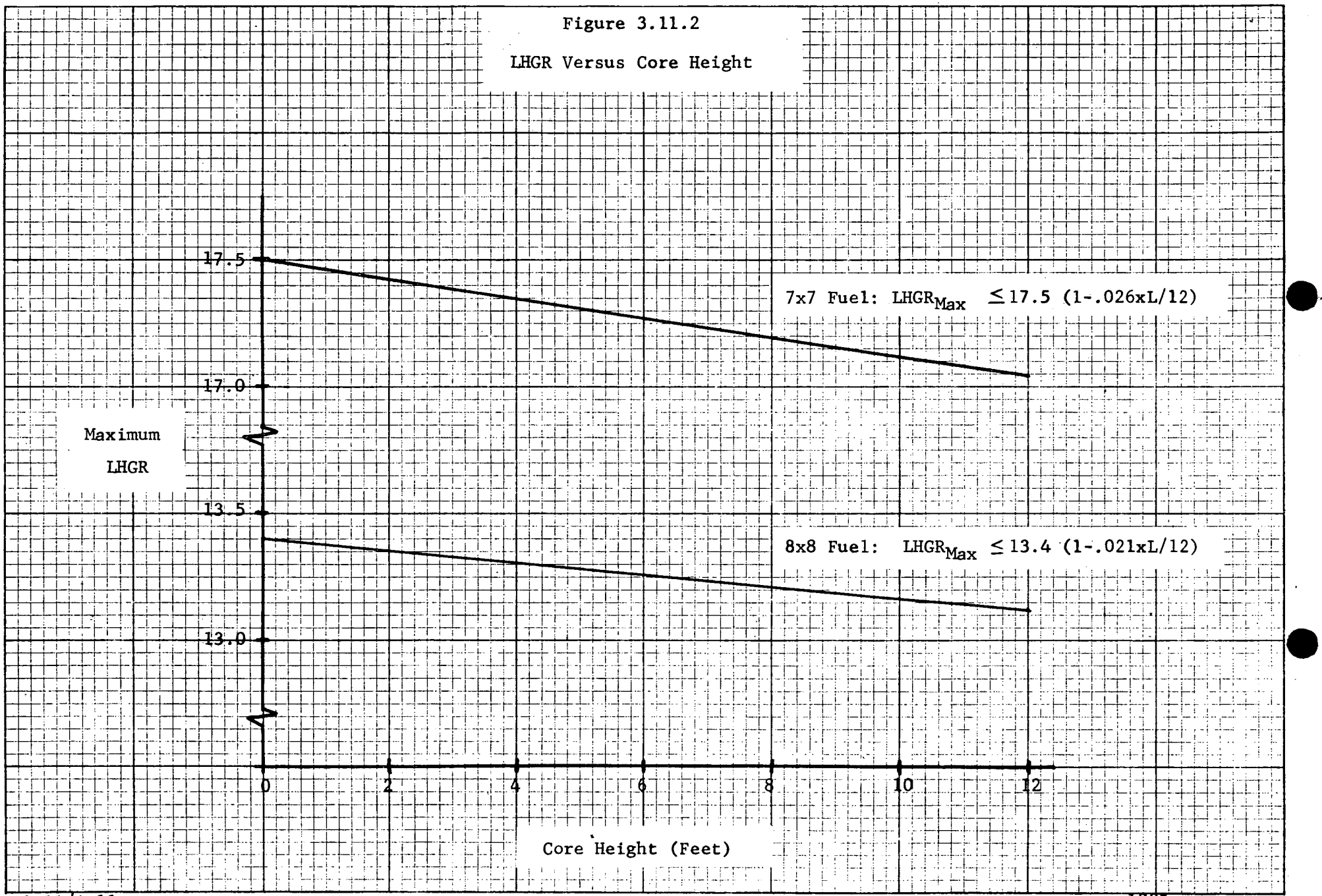



Figure 3.11.1-A
Maximum Average Planar Linear Heat Generation Rate Versus Planar Average Exposure Monticello 8D219 Fuel

Figure 3.11.2

LHGR Versus Core Height



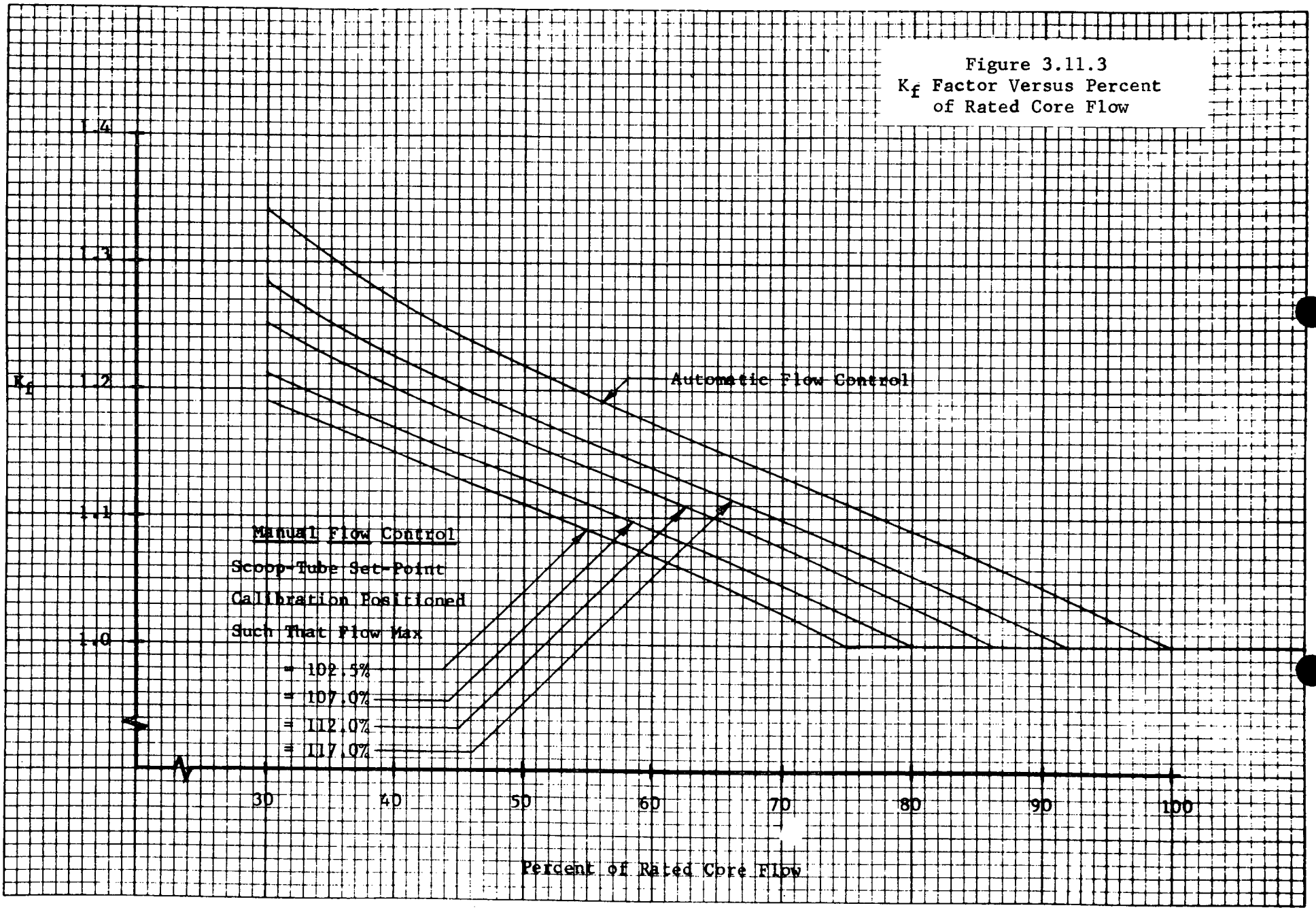


Figure 3.11.3
$K_f$ Factor Versus Percent
of Rated Core Flow
1.4
1.3
$K_f$
1.2
1.1
1.0
Automatic Flow Control
Manual Flow Control
Scoop-Tube Set-Point
Calibration Positioned
Such That Flow Max
= 102.5%
= 107.0%
= 112.0%
= 117.0%
30
40
50
60
70
80
90
100
Percent of Rated Core Flow

## LIST OF FIGURES


| Figure No. | | Page No. |
|---|---|---|
| 2.1-1 | Deleted | |
| 2.3.1 | APRM Flow Referenced Scram and Rod Block Trip Settings | |
| 2.3.2 | Relationship Between Peak Heat Flux and Power for Peaking Factor of 3.08 | 12 |
| 4.1.1 | 'M' Factor - Graphical Aid in the Selection of an Adequate Interval Between Tests | 46 |
| 4.2.1 | System Unavailability | 74 |
| 3.4.1 | Sodium Pentaborate Solution Volume - Concentration Requirements | 92 |
| 3.4.2 | Sodium Pentaborate Solution Temperature Requirements | 93 |
| 3.6.1 | Change in Charpy V Transition Temperature versus Neutron Exposure | 122 |
| 3.6.2 | Minimum Temperature versus Pressure for Pressure Tests | 122A |
| 3.6.3 | Minimum Temperature versus Pressure for Mechanical Heatup or Cooldown Following Nuclear Shutdown | 122B |
| 3.6.4 | Minimum Temperature versus Pressure for Core Operation | 122C |
| 4.6.1 | Deleted | |
| 4.6.2 | Chloride Stress Corrosion Test Results @ 500°F | 123 |
| 4.8.1 | Off-gas Storage Tank Gross Activity Limits | 176A |
| 3.11.1-A | Maximum Average Linear Heat Generation Rate versus Planar Average Exposure Monticello 8D219 Fuel | 189H |
| 3.11.1-B | Maximum Average Linear Heat Generation Rate versus Planar Average Exposure Monticello 7D230 Fuel | 189I |

## LIST OF FIGURES


| Figure No. | | Page No. |
|---|---|---|
| 3.11.1-C | Maximum Average Linear Heat Generation Rate versus Planar Average Exposure Monticello 8D262 Fuel | 189J |
| 3.11.1-D | Maximum Average Linear Heat Generation Rate versus Planar Average Exposure Monticello 8D250 Fuel | 189K |
| 3.11.2 | LHGR Versus Core Height | 189L |
| 3.11.3 | $K_f$ Factor versus Percent of Rated Core Flow | 189M |
| 6.1.1 | NSP Corporate Organizational Relationship to On-Site Operating Organization | 193 |
| 6.1.2 | Functional Organization for On-Site Operating Group | 194 |