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 AUTH. NAME AUTHOR AFFILIATION
 DISE, D.P. Niagara Mohawk Power Corp.
 RECIP. NAME RECIPIENT AFFILIATION
 EISENHUT, D.G. Division of Licensing

SUBJECT: Forwards training program outline scheduled for Spring 1981
 refueling outage. Program satisfies requirements of NUREG-
 -0737, Item II.B.4 re training for mitigating core damage.
 Program will be completed by 811001.

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March 25, 1981

Mr. Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555



Dear Mr. Eisenhut:

Re: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

NUREG 0737 Item II.B.4 - Training for Mitigating Core Damage requires a training program to be developed to teach the use of installed equipment and systems to control or mitigate accidents in which the core is severely damaged. Enclosed is the training program outline which Niagara Mohawk will use to satisfy this requirement at Nine Mile Point Unit 1.

The training for mitigating core damage as described in the enclosed program outline is scheduled to begin following completion of the Spring 1981 Refueling Outage. Since approximately 50% of the information provided in the training program has been included in the Licensed Reactor Operator Requalification Program and in the Reactor Operator and Senior Reactor Operator License Preparation Programs for the past several years, the delay in initiation of the training program until after the Spring 1981 Refueling Outage is not considered to be a safety hazard. The training program will be completed by October 1, 1981.

Sincerely,

NIAGARA MOHAWK POWER CORPORATION

Donald P. Dise
Donald P. Dise
Vice President Engineering

PEF:bd

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NIAGARA MOHAWK POWER CORPORATION

NINE MILE POINT UNIT 1

NUREG 0737 ITEM II.B.4

TRAINING FOR MITIGATING CORE DAMAGE

This program has been developed to ensure that all personnel listed in Table I are trained in the use of installed plant systems to recognize, control, and/or mitigate an accident in which the core is severely damaged.

The columns adjacent to the course material reference the paragraph H.R. Denton's letter of March 28, 1980, to all Power Reactor Applicants and Licensees, Enclosure 3, and/or INPO's Guidelines for Training to Recognize and Mitigate the Consequences of Core Damage, Rev. I, January 15, 1981.



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I. Review of Heat Transfer	4.1.9
A. Modes of Heat Transfer	
1. Conduction	
2. Convection	
a. Natural	
b. Forced	
3. Radiation	
B. Boiling Regime	
1. Sub-cooled	
2. Nucleate	
3. Bulk	
4. Film	
5. Transition	
C. Flow	
1. Single Phase	
2. Two Phase	
a. Bubble flow	
b. Slug	
c. Annular	
d. Mist	
D. Cooling Mechanics	4.1.3
1. Flood	4.1.6
2. Steam	4.1.8
E. Core Thermal Characteristics	
1. Thermal Hydraulics	
a. Laminar flow	
b. Turbulent flow	
2. Thermal Parameter	4.1.6
a. MCPR	4.1.7
b. LHGR	4.9.3
c. APLHGR	
3. Fuel Pin Heat Transfer	
a. Normal	
b. Accident	
II. Heat Transfer Systems	4.1.4
A. Review of Thermal Cycles	
1. Open Cycle	
2. Closed Cycle	
B. Normal Systems	4.1.1
1. Main Feed and Steam System	4.9.5
2. Shutdown Cooling System	
3. Clean-up System	
4. TBCLC	
5. RBCLC	
6. Service Water	
7. Circulating Water	
8. Control Rod Drive	
9. Drywell Coolers	



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II. Heat Transfer Systems (cont'd)

C. Abnormal Heat Removal Systems and Capacities

1. Emergency Condensers
2. HPCI
3. Core Spray
4. Containment Spray
5. Raw Water Injection
 - a. Feedwater
 - b. Core Spray
 - c. Containment Spray

4.9.5
4.9.6
4.9.9

D. Degraded Heat Removal Modes and Capacities

1. Feed and Bleed Methods
 - a. CRD, Clean-up
 - b. Core Flood - Blowdown via reliefs
 - c. Other
2. Containment Flooding

4.9.7

III. Process Instruments

A. Review Critical Parameters

1. Level
 - a. Vessel
 - b. Containment
2. Pressure
 - a. Vessel
 - b. Containment
3. Temperature
 - a. Vessel
 - b. Containment
4. Reactor Flux
5. System Flows
6. Radiation Process Monitors

4.4.1
4.4.3E
4.7.1

B. Critical Parameter Measurement

1. Level
 - a. Types of instruments and ranges
 - b. Alternate methods of measurement
 - c. Failure mode
 - d. Recovery
2. Pressure
 - a. Types of instruments and ranges
 - b. Alternate methods of measurement
 - c. Failure mode
 - d. Recovery

HD-3A-1 4.7.2
3A-2 4.7.3
HD-3C-1 4.7.4
3C-2 4.7.5
4.7.6



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III. Process Instruments (cont'd)

B. Critical Parameter Measurement (cont'd)

3. Temperature

- a. Types of instruments and ranges
- b. Alternate methods of measurement
- c. Failure mode
- d. Recovery

4. Flux

- a. Types of instruments and ranges
- b. Alternate methods of measurement
- c. Failure mode
- d. Recovery

5. Flow

- a. Types of instruments and ranges
- b. Alternate methods of measurement
- c. Failure mode
- d. Recovery

6. Radiation Monitors

- a. Types of instruments and ranges
- b. Alternate methods of measurement
- c. Failure mode
- d. Recovery

7. Hydrogen and Oxygen Monitors

- a. Types of instruments and ranges
- b. Alternate methods of measurement
- c. Failure mode
- d. Recovery

HD-3E-1
3E-2

4.4.2
4.6.4
4.7.7
4.8.4
4.8.5
4.8.6

C. Process Computer

1. Capabilities
2. Usage during accidents and transients
3. Sensor failures

HD-3A-3

IV. Recognizing Core Damage

A. Symptoms of Core Damage

1. Hi Radiation Alarms
2. Core Hot Spots
3. H² and O² Increase - drywell and off-gas
4. Coolant Activity
 - a. Isotopic analysis to determine extent of damage

HD-3D-2

4.4.3
4.6.4
4.9.4



3
4
5

IV. Recognizing Core Damage (cont'd)		
B. Gas Generation	HD-F-1	4.3.1
1. Sources	HD-F-2	4.4.4
a. Metal - Water		4.7.7
b. Water disassociation		
c. ZrO ₂ - UO ₂ eutectic		
2. Associated Problems		4.3.2
a. Gas binding		4.4.4
b. Non-condensable gas accumulation		4.6.1
c. H ₂ combustion		4.6.2
d. Radiation hazards		4.6.3
		4.6.4
		4.6.5
		4.6.6
		4.8.2
		4.8.3
C. Coolant Activity Problems	HD-3D-1	
1. Radiation/Contamination problems		
V. Mitigation of Core Damage		
A. Potentially Damaging Operating Conditions		4.2.1
1. Limiting Transient Conditions with Complicating Equipment Failures		
B. Core Recriticality		4.5.1-9
1. ATWS		4.1.5
2. SBLC		
C. Review Emergency Procedure Guidelines, including cautions and basis		4.2.2
		4.9.1
		4.9.8
		4.9.10
		4.9.14
VI. Site Emergency Plan and Procedures; Administrative Procedures		4.4.5
		4.8.1
		4.9.12
A. Site Emergency Plan and Procedures		
1. EPP-1, EPP-6, EPP-12, EPP-13, EPP-20		
B. Administrative Procedures		
1. APN-21		
2. APN-2, 2A, 2B		



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TABLE I

PLANT STAFF
TRAINING
RECOMMENDATIONS

REVIEW OF
HEAT TRANSFER

HEAT TRANSFER
SYSTEMS

PROCESS
INSTRUMENTS

RECOGNIZING
CORE
DAMAGE

MITIGATION
OF CORE
DAMAGE

EPPs AND
ADMINISTRATIVE
PROCEDURES

Operations Mngr.
Shift Supervisor
Sr. Licensed Oper.

X

X

X

X

X

X

Technical and
Maintenance
Managers

X

X

X

X

X

Reactor Analyst
Technicians and
Supervisors

X

X

X

X

X

X

Plant Manager/
Asst. Plant Mngr.

X

X

X

X

X

X

I&C
Technicians

X

X

X

X

Radiation Prot.
Technician

X

X

X

X

Non-Licensed
Operators

X

X

X

X

X

X

Licensed
Operator

X

X

X

X

X

X

Shift Technical
Advisor

X

X

X

X

X

X

X - DENOTES REQUIRED ATTENDANCE



10-10-10

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