Docket File

OCT 26 1984

Docket No. 50-336

LICENSEE: Northeast Nuclear Energy Company

FACILITY: Millstone Nuclear Power Station, Unit No. 2

SUBJECT: SUMMARY OF MEETING WITH NORTHEAST NUCLEAR ENERGY COMPANY ON FUEL ASSEMBLY RECONSTITUTION FOR MILLSTONE UNIT 2

A meeting was held with Northeast Nuclear Company (NNECO) on October 3, 1984.

The purpose of the meeting was to convey information about methods being used to reconstitute fuel assemblies containing leaking pins.

Background

Millstone Unit 2 is currently in Cycle 6 operation which began in January 1984 and is scheduled to end in February 1985. During the outage between Cycles 5 and 6, NNECO identified 26 out of 217 fuel assemblies as containing leakers. With one exception, all 26 fuel assemblies were removed from the core for cycle 6 operation and stored in the spent fuel pool. The majority of these assemblies had been in the core for only one cycle and contained only one failed rod per assembly.

NNECO has already made a determination that fuel assembly reconstitution is a 50.59 issue and as such NRC review is not required. Nevertheless, the presentation was given to keep the staff informed.

Slides shown at the meeting are enclosed (enclosure 2), along with a listing of meeting attendees (enclosure 1).

Summary of Presentation

A brief summary about the expected level of fuel failures in Cycle 6 operation was given. From the analysis of Iodine levels and rations, NNECO expects similar numbers of failed assemblies and defect sizer as seen at the end of the prior cycle. At the end of the current cycle, they plan to do 100% sipping of the core and remove all fuel assemblies containing leakers. In addition, to the normal discharge of 72 fuel assemblies, an additional 40 assemblies are expected to be discharged due to both leakers and symmetry considerations. The failure mechanism remains unknown for cycle 6 operation, but it is suspected that the dominant failure mechanism will be debris fretting as concluded for cycle 5 operation. Efforts to keep debris to a

Docket No. 50-336

LICENSEE: Northeast Nuclear Energy Company

FACILITY: Millstone Nuclear Power Station, Unit No. 2

SUBJECT: SUMMARY OF MEETING WITH NORTHEAST NUCLEAR ENERGY COMPANY ON FUEL ASSEMBLY RECONSTITUTION FOR MILLSTONE UNIT 2

A meeting was held with Northeast Nuclear Company (NNECO) on October 3, 1984.

The purpose of the meeting was to convey information about methods being used to reconstitute fuel assemblies containing leaking pins.

Background

Millstone Unit 2 is currently in Cycle 6 operation which began in January 1984 and is scheduled to end in February 1985. During the outage between Cycles 5 and 6, NNECO identified 26 out of 217 fuel assemblies as containing leakers. With one exception, all 26 fuel assemblies were removed from the core for cycle 6 operation and stored in the spent fuel pool. The majority of these assemblies had been in the core for only one cycle and contained only one failed rod per assembly.

NNECO has already made a determination that fuel assembly reconstitution is a 50.59 issue and as such NRC review is not required. Nevertheless, the presentation was given to keep the staff informed.

Slides shown at the meeting are enclosed (enclosure 2), along with a listing of meeting attendees (enclosure 1).

Summary of Presentation

A brief summary about the expected level of fuel failures in Cycle 6 operation was given. From the analysis of Iodine levels and rations, NNECO expects similar numbers of failed assemblies and defect sizer as seen at the end of the prior cycle. At the end of the current cycle, they plan to do 100% sipping of the core and remove all fuel assemblies containing leakers. In addition, to the normal discharge of 72 fuel assemblies, an additional 40 assemblies are expected to be discharged due to both leakers and symmetry considerations. The failure mechanism remains unknown for cycle 6 operation, but it is suspected that the dominant failure mechanism will be debris fretting as concluded for cycle 5 operation. Efforts to keep debris to a

considerations. The failure mechanism remains unknown for Cycle 6 operation, but it is suspected that the dominant failure mechanism will be debris fretting as concluded for Cycle 5 operation. Efforts to keep debris to a very minimum will be made at the next refueling.

The 40 additional assemblies which will have to be reinserted will come from two sources. Once burned Batch A fuel (24 assemblies) which contained no leakers, but required guide tube sleeves will be used. The balance of the assemblies will come from reconstituted fuel. NNECO has identified 20 fuel assemblies currently in the spent fuel pool (i.e. Batches F & G) as candidates for reconstitution. Thirteen out of the 20 assemblies require removing all the pins from the old cage (donner) and inserting the pins into a new cage supplied by Combustion Engineering (CE). All pins will be inserted into the new cage in the same array as the old using a series of templates to ensure proper placement of the pin within the array. The leaking pin is to be replaced with a stainless steel dummy rod to simplify the physics calculations. As each pin is removed from the donner cage, an eddy current test is to be performed to ensure that all pins are sound prior to reconstitution.

The preferred method for reconstituting fuel assemblies is referred to as drill and rivet and among other reasons it is more desirable than the preceding method because it requires less work to reconstitute (i.e., only the failed fuel pin is removed and a dummy rod inserted in its place.) However, it is projected that only 7 fuel assemblies can be reconstituted in this manner due to the location of the failed pin in the array. CE, who is the contractor for this work, has had successful experience with both methods of reconstitution. To help ensure that no failed pins go back into the core, all reconstituted assemblies will be sipped before insertion. The schedule for reconstitution is the October to December 1984 time frame.

Conclusion

The staff requested and NNECO agreed to provide more details on how the radiation dose numbers were calculated. NNECO also plans to keep the staff advised of progress made on reconstitution and inform the staff when new information becomes available about the Cycle 6 failure mechanism. That information is not expected until after the core has been sipped at the end of Cycle 6 operation. Some of the analysis supporting the thermal hydraulic, physics and mechanical design of the reconstituted fuel assembly may be requested with NNECO's submittal of the Reload Safety Analysis in support of Cycle 7 operation to assure continued conformance to the design and safety limits of the plant. Cycle 7 operation is not expected to begin until June 1985.

Original signed by:

Dee B. Osborne, Project Manager
Operating Reactors Branch No. 3, DL

Enclosures:
As stated

ORB#3:DL	ORB#3:DL	ORB#3:DL
PKreutzer	DOsborne:ef	JMiller
10/15/84	10/16/84	10/24/84

Enclosure 1

List of Attendees

Nuclear Regulatory Commission

Dee Osborn	DL/CRB#3
Larry Phillips	DSI/CPB
Richard Lobel	DSI/CPB
John Minns	DSI/RAB
Sy Block	DSI/RAB

Northeast Utilities

Michael Childers
Michael Hills

Combustion Engineering

Thomas Bernocki

The NRC Calendar

Lynn Connor

MILLSTONE UNIT TWO

FUEL PERFORMANCE/RECONSTITUTION

INFORMATIONAL MEETING

OCTOBER 3, 1984

AGENDA

OPENING REMARKS	M. L. CHILDERS	GFL
FUEL PERFORMANCE REVIEW	M. P. HILLS	REB
RELOAD STRATEGY	M. P. HILLS	REB
PROJECT DESCRIPTION	M. P. HILLS	REB
RECONSTITUTION, CAGE SWAP	M. P. HILLS	REB
RECONSTITUTION, DRILL AND RIVET	M. P. HILLS	REB
ALARA/HEALTH PHYSICS	M. P. HILLS	REB
WRAPUP	M. L. CHILDERS	GFL

MILLSTONE UNIT 2

* NSSS SUPPLIER-COMBUSTION ENGINEERING (CE)

* LICENSED POWER LEVEL - 2700 MWT

* DATE OF COMMERCIAL OPERATION - 12/75

* PRESENT FUEL SUPPLIER - WESTINGHOUSE (W)

* CORE CONFIGURATION

  - 217 FUEL ASSEMBLIES
  - 14 X 14 FUEL ROD ARRAY

* CYCLE 5 CORE

  - 144 (W) FUEL ASSEMBLIES
  - 73 CE FUEL ASSEMBLIES

* FINISHED CYCLE 5 IN MAY, 1983

* CYCLE 6 CORE

  - 196 (W) FUEL ASSEMBLIES
  - 21 CE FUEL ASSEMBLIES

MILLSTONE UNIT 2 (CONT'D)

* STARTED CYCLE 6 IN JANUARY, 1984

* SCHEDULED TO FINISH IN FEBRUARY, 1985

MILLSTONE UNIT 2 FUEL ASSEMBLY FAILURE SUMMARY

LEAKING ASSEMBLIES IDENTIFIED BY SIPPING AT EOC 5

* BATCH G - 16 OF 72
* BATCH F - 5 OF 72
* BATCH E - 5 OF 72
* BATCH B - 0 OF 1

CYCLE 6 COOLANT ACTIVITY DATA

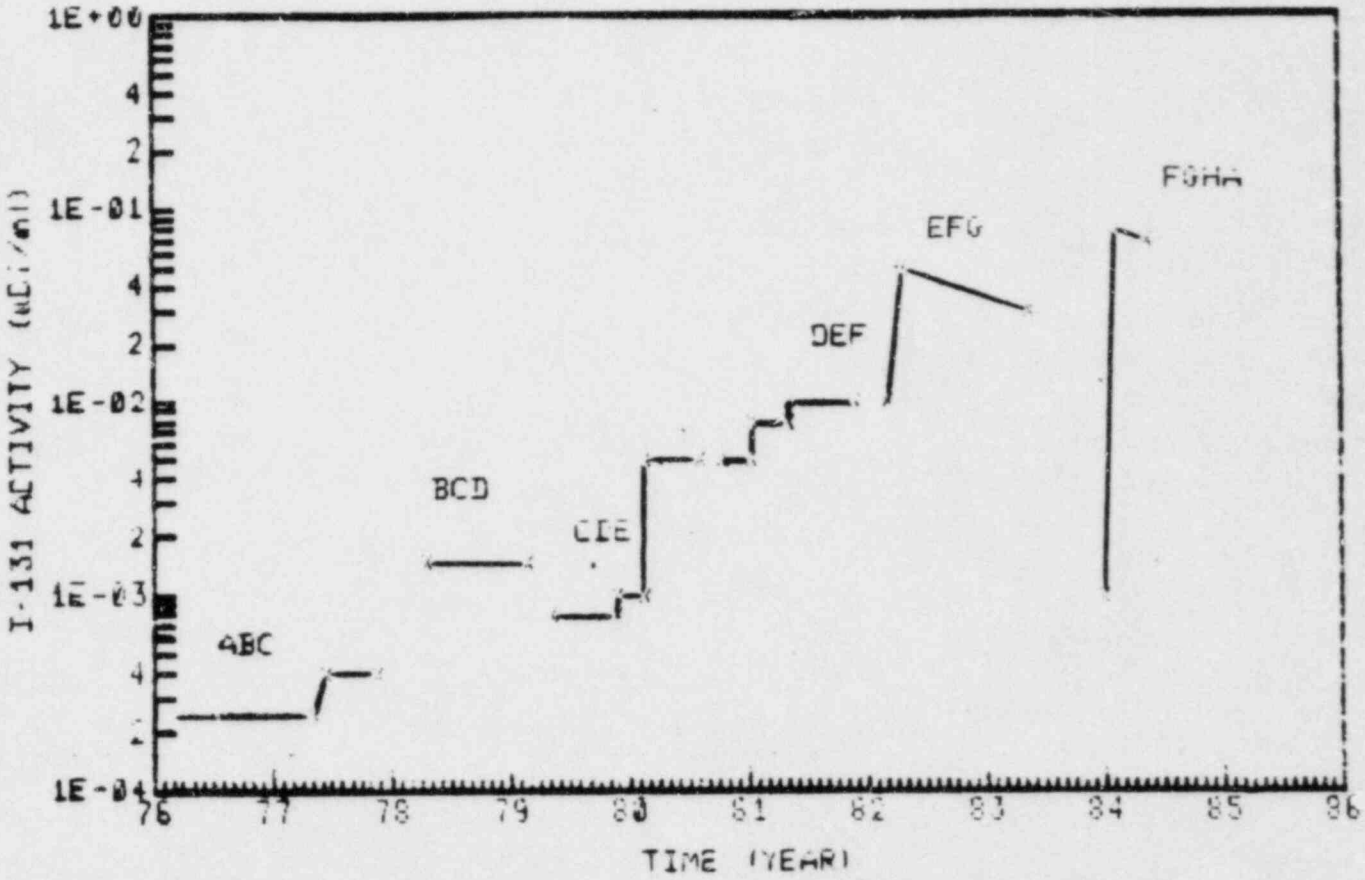
* TIMING OF RISE IN I-131 AND I RATIO SIMILAR TO CYCLE 5

* LEVEL OF I-131 SIMILAR TO CYCLE 5, SUGGESTING A SIMILAR NUMBER OF FAILURES

* MAGNITUDE OF I RATIO SIMILAR TO CYCLE 5, SUGGESTING SIMILAR DEFECT SIZES

* INSUFFICIENT CESIUM RATIO DATA TO DETERMINE BURNUP OF FAILED FUEL

MILLSTONE II I-131 ACTIVITY
FROM INITIAL STARTUP



CONCLUSIONS

* COOLANT IODINE LEVELS LOW RELATIVE TO TECHNICAL SPECIFICATION LIMITS

* DATA FROM CYCLES 5 AND 6 INDICATE FAILURES OCCUR EARLY AND ARE NOT PROGRESSIVE

* DOMINANT FAILURE MECHANISM DURING CYCLE 5 WAS DEBRIS FRETTING

* FAILURE MECHANISM AND BURNUP OF FAILED FUEL UNKNOWN FOR CYCLE 6

* NUMBER OF FUEL FAILURES IN CYCLE 6 APPEAR SIMILAR TO CYCLE 5

RELOAD STRATEGY

* MINIMIZE IMPACT OF FAILED FUEL UPON RELOAD ENGINEERING

* ENSURE ADEQUATE FUEL INVENTORY AVAILABLE

* RECONSTITUTION OF PRIOR FAILED FUEL

* DEVELOP TECHNOLOGY FOR OUTAGE RECONSTITUTION (IF NECESSARY)

* ASSURE NEW FUEL CAN BE DELIVERED IF RECONSTITUTION FAILS

SCOPING ANALYSES

* IDENTIFY POSSIBLE LOADING PATTERNS
* EVALUATION OF KEY PHYSICS PARAMETERS
* IDENTIFICATION OF POTENTIAL CHANGES TO TECHNICAL SPECIFICATIONS

EOC 6 WORKSCOPE

* SIPPING
* VISUAL INSPECTIONS
* ULTRASONIC - MAYBE

PROJECT OVERVIEW

* UTILIZED NU, OUTSIDE VENDORS, AND OUTSIDE CONSULTANT TO DEVELOP STRATEGY

* LOOKED AT AVAILABLE AND NEW TECHNOLOGY IN THE U.S. AND IN EUROPE

* UP TO 40 REINSERT ASSEMBLIES ARE EXPECTED TO BE DISCHARGED AT THE END OF THIS CYCLE DUE TO LEAKERS AND SYMMETRY CONSIDERATIONS

SOURCE OF ASSEMBLIES

* 24 A ASSEMBLIES (~~TWICE~~ ONCE BURNED) WILL BE MADE AVAILABLE BY SLEEVING

* MILLSTONE UNIT 2 NEEDS A MINIMUM OF 16 ONCE OR TWICE BURNED ASSEMBLIES OR EQUIVALENT

POSSIBLE SOURCE OF THE 16 ASSEMBLIES

* NEW, LOW ENRICHMENT FUEL ASSEMBLIES

* RECONSTITUTED CYCLE 5 DISCHARGERS

* A COMBINATION OF RECONSTITUTED AND BACKUP NEW FUEL

NEW FUEL

* CAN DELIVER NEW FUEL WITHIN 90 DAYS
* ENRICHMENT HARD TO PREDICT
* LOW ENRICHMENT (~1%) PREFERRED
* RESULTS IN VERY LARGE INVENTORY IN THE FUTURE

RECONSTITUTED CYCLE 5 DISCHARGES

* PROVIDES BEST ALTERNATIVE IF RECONSTITUTION CAN BE DONE IN OCTOBER - DECEMBER AND IF YIELD EXCEEDS OR EQUALS 16 ASSEMBLIES
* DECISION MADE TO ATTEMPT RECONSTITUTION FOR CYCLE 7 INVENTORY

TECHNOLOGIES CONSIDERED

* INVERT FUEL ASSEMBLY AND REMOVE BOTTOM NOZZLE

  - ALLOWS EDDY CURRENT OF FUEL RODS
  - GOOD EXPERIENCE BASE

* REMOVE TOP NOZZLE AND PLACE PINS IN NEW SKELETON

  - ALLOWS FULL EDDY CURRENT
  - GOOD EXPERIENCE BASE

* DRILL TOP NOZZLE AND REPLACE DEFECTIVE PIN

  - NO EDDY CURRENT, MUST TRUST ULTRASONIC
  - GOOD EXPERIENCE BASE

TECHNOLOGY CHOSEN

* A COMBINATION OF CAGE SWAP METHOD AND THE DRILL AND RIVET METHOD WAS CHOSEN

* PERFORM THE CAGE SWAP PROCEDURE ON 13 FUEL ASSEMBLIES

  G04, G24, G32, G35, G41, G47
  G56, G60, F33, F37, F38, F41, F42

  EDDY CURRENT EACH FUEL ROD TO CHARACTERIZE FAILURES OR ADDITIONAL DAMAGE. DATA TO BE UTILIZED FOR DECISION ON ELIMINATION OF ADDITIONAL FUEL RODS AND VALIDITY OF ULTRASONIC DATA

* PERFORM DRILL AND RIVET PROCEDURE ON 7 FUEL ASSEMBLIES

  G05, G10, G26, G57, G62, G66, G68

PROJECT YIELD

* TYPE G (ONCE-BURNED)

15	FUEL ASSEMBLIES TO BE RECONSTITUTED
5	SOUND SYMMETRIC FUEL ASSEMBLIES
20	

* TYPE F (TWICE-BURNED)

5	FUEL ASSEMBLIES TO BE RECONSTITUTED
3	SOUND SYMMETRIC FUEL ASSEMBLIES
8	

* TYPE A SLEEVING PROJECT (SEPARATE)
  24 FUEL ASSEMBLIES

* 52 FUEL ASSEMBLIES AVAILABLE

RECONSTITUTION TEAM

NUSCO
- PROJECT MANAGEMENT
- MECHANICAL ANALYSES
- FUEL PERFORMANCE SCOPING
- REVIEW GROUP FOR D&R DECISION
- DECISION ON NEW FUEL PURCHASE
- PLANT INTERFACES, H.P., QA, ETC.

CE
- RECONSTITUTION SERVICES
- NEW CAGES
- MECHANICAL ANALYSES
- EDDY CURRENT TECHNOLOGY

W
- SCOPING ANALYSES
- FINAL ANALYSES FOR RELOAD
- CONSULTATION ON RECONSTITUTION CANDIDATES

RECONSTITUTION TEAM - SITE

* NUSCO

  - PROJECT ENGINEER
  - SITE COORDINATOR
  - SHIFT SUPPORT

* NNECO

  - HEALTH PHYSICS
  - SHIFT SUPPORT

* CE

  - RECONSTITUTION TEAMS

* WORK TO BE DONE 24 HOURS PER DAY

CAGE SWAP TECHNIQUE

* 13 FUEL ASSEMBLIES SCHEDULED TO BE RECONSTITUTED WITH THIS PROCEDURE

  - W CAGE IS NOT RECONSTITUTABLE

  - ULTRASONIC DATA RELIABILITY NOT ESTABLISHED

* W AND CE FUEL DESIGNS ARE COMPATIBLE

* APPROXIMATELY 40 HOURS PER FUEL ASSEMBLY

* FUEL ASSEMBLIES INVOLVED

  G04, G24, G32, G35, G41, G47
  G56, G60
  F33, F37, F38, F41. F42

GENERAL PROCEDURE

* CUT GUIDE TUBES ON DONOR FUEL ASSEMBLY AND REMOVE UPPER END FITTING

* REMOVE FUEL RODS ONE AT A TIME AND PLACE SOUND RODS IN HOST CAGE

  - EDDY CURRENT EACH ROD
  - REPLACE FAILED RODS WITH STAINLESS STEEL DUMMY RODS
  - FAILED RODS INTO SPARE SKELETON

* EVALUATE EDDY CURRENT DATA FOR ADDITIONAL NON-FAILED RODS TO BE REMOVED

* PLACE NEW UPPER END FITTING ON HOST CAGE

* PLACE OLD UPPER END FITTING ON DONOR CAGE WITH REMOVEABLE "SPEARS"

MAJOR CONSIDERATIONS IN PIN SHUFFLE

* FUEL PINS REMOVED WILL BE REPLACED WITH STAINLESS STEEL DUMMIES

* NO PIN SHUFFLE TO DIFFERENT LOCATIONS WITHIN FUEL ASSEMBLY

* PHYSICS SCOPING CRITERIA EXISTS

* THERMAL HYDRAULIC CRITERIA EXISTS

* PIN DAMAGE GUIDELINES WILL BE DEVELOPED

* ALL EDDY CURRENT DATA WILL BE REVIEWED PRIOR TO COMPLETION OF RECONSTITUTION PROCEDURE

* ALL THREE PARTIES (NUSCO, W, AND CE) HAVE BEEN INVOLVED IN VARIOUS ASPECTS

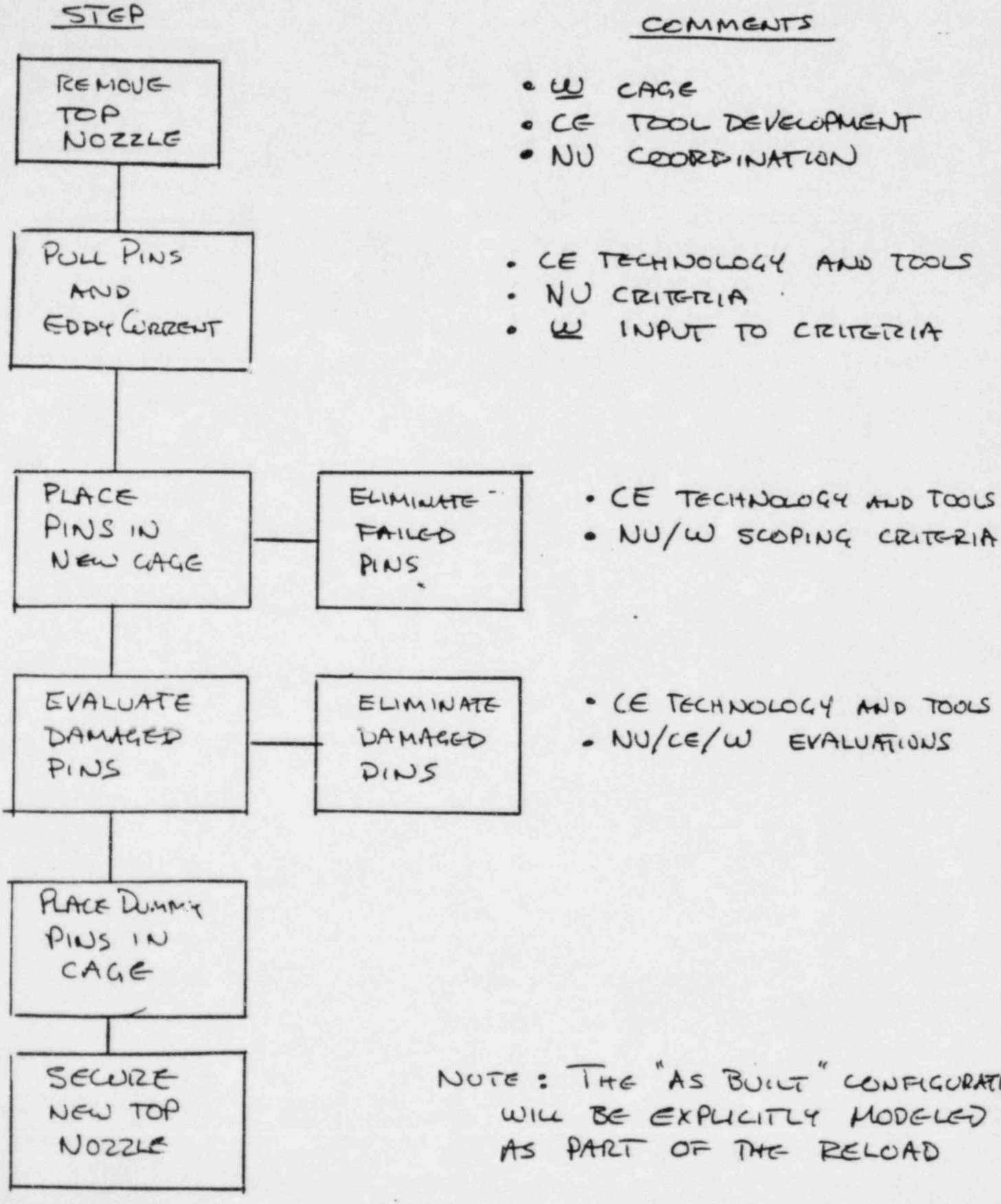
CONTROL ON PIN SHUFFLE

* TEMPLATE UTILIZED ON DONOR AND HOST CAGE

* ONLY ONE ROD AT A TIME IS REMOVED

* BREAKAWAY AND STEADY STATE FORCE LIMITS

* ROD TRAVELER SHEET UTILIZED


STEP
COMMENTS
REMOVE TOP NOZZLE
• W CAGE
• CE TOOL DEVELOPMENT
• NU COORDINATION
PULL PINS AND EDDY CURRENT
• CE TECHNOLOGY AND TOOLS
• NU CRITERIA
• W INPUT TO CRITERIA
PLACE PINS IN NEW CAGE
ELIMINATE FAILED PINS
• CE TECHNOLOGY AND TOOLS
• NU/W SCOPING CRITERIA
EVALUATE DAMAGED PINS
ELIMINATE DAMAGED PINS
• CE TECHNOLOGY AND TOOLS
• NU/CE/W EVALUATIONS
PLACE DUMMY PINS IN CAGE
SECURE NEW TOP NOZZLE
NOTE: THE "AS BUILT" CONFIGURATION WILL BE EXPLICITLY MODELED AS PART OF THE RELOAD

* NEW CAGE (CE) WILL BE THE SAME AS THOSE PREVIOUSLY UTILIZED AT MILLSTONE UNIT 2

  - NEW GUIDETUBE/SLEEVE ATTACHMENT DESIGN WILL BE UTILIZED

* MECHANICAL DESIGN OF THE CAGE IS SUCH THAT ROD GROWTH DIFFERENCES DUE TO DIFFERENCES IN EXPOSURE HAVE BEEN ACCOUNTED FOR

DRILL AND RIVET TECHNIQUE

* 7 FUEL ASSEMBLIES SCHEDULED TO BE DONE IN THIS MANNER

* DATA FROM EDDY CURRENT WORK WILL BE UTILIZED TO ESTABLISH THE RELIABILITY OF THE ULTRASONIC DATA

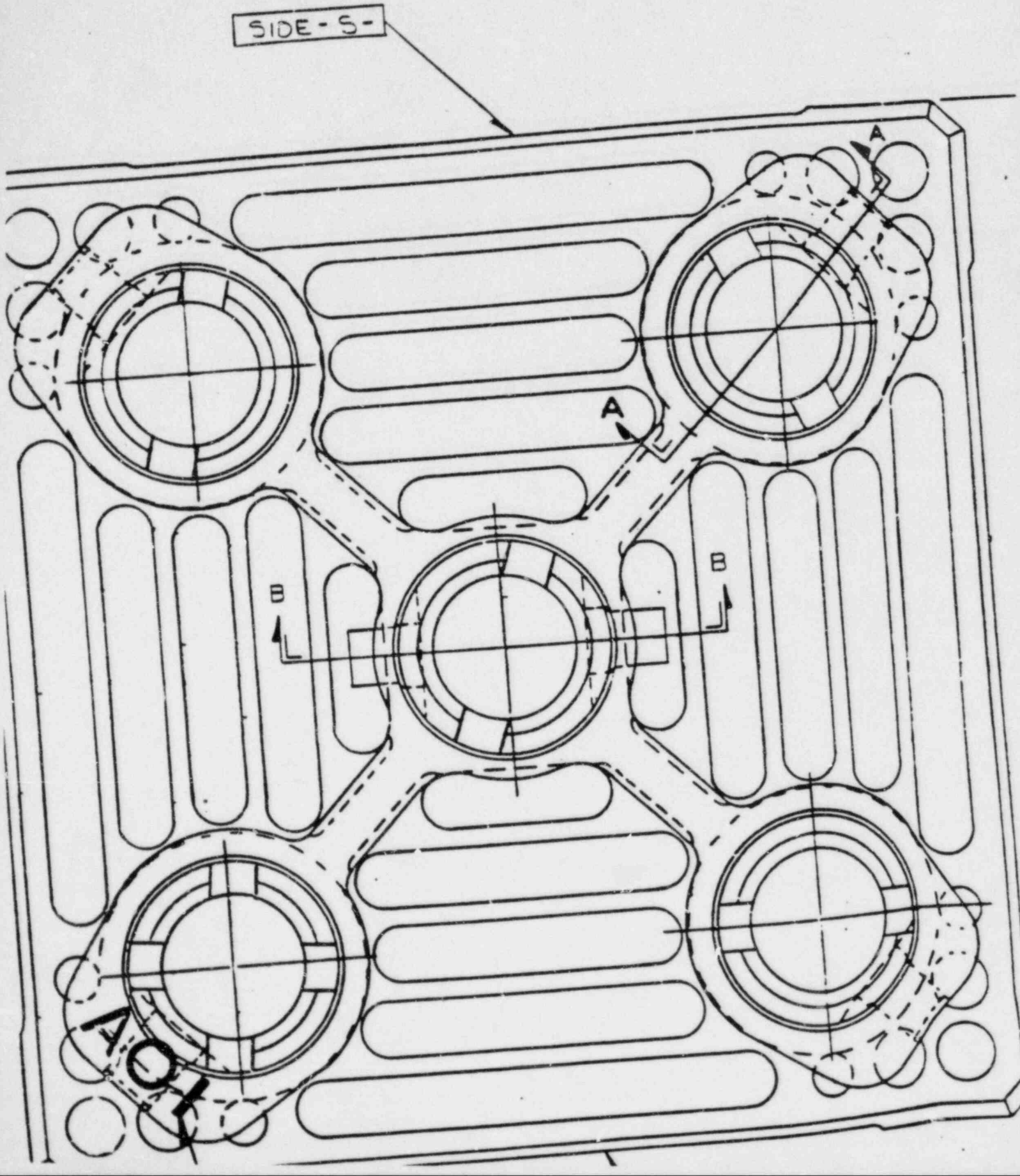
* TECHNIQUE MINIMIZES FUEL HANDLING

* APPROXIMATELY 18 HOURS PER FUEL ASSEMBLY

* FUEL ASSEMBLIES INVOLVED

  G05, G10, G26, G57
  G62, G66, G68

* TECHNIQUE WILL BE DEMONSTRATED IF IT IS REQUIRED FOR THE SPRING OUTAGE


SIDE - S -
A
A
B
B
AOL

GENERAL PROCEDURE

* MOUNT FUEL ASSEMBLY IN ELEVATOR AND DRILL THE ADAPTER PLATE

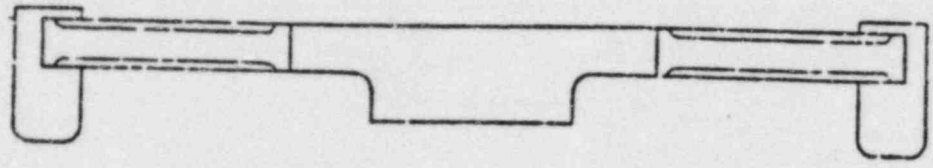
  - HOLE FOR CORNER RODS
  - REMOVE WEB FOR INTERIOR RODS

* REMOVE FAILED ROD AND REPLACE WITH STAINLESS STEEL DUMMY

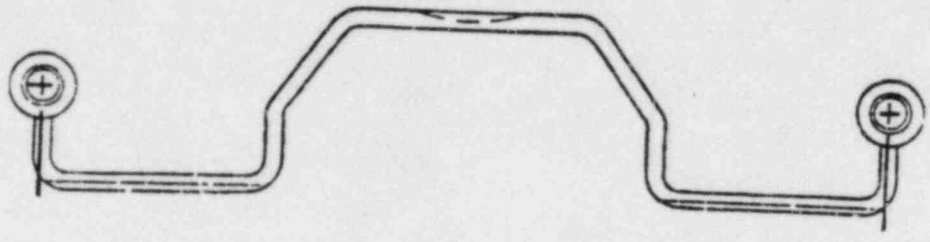
* INSTALL RETENTION PLATE AND CRIMP RIVETS

RETENTION PLATE - TYPICAL

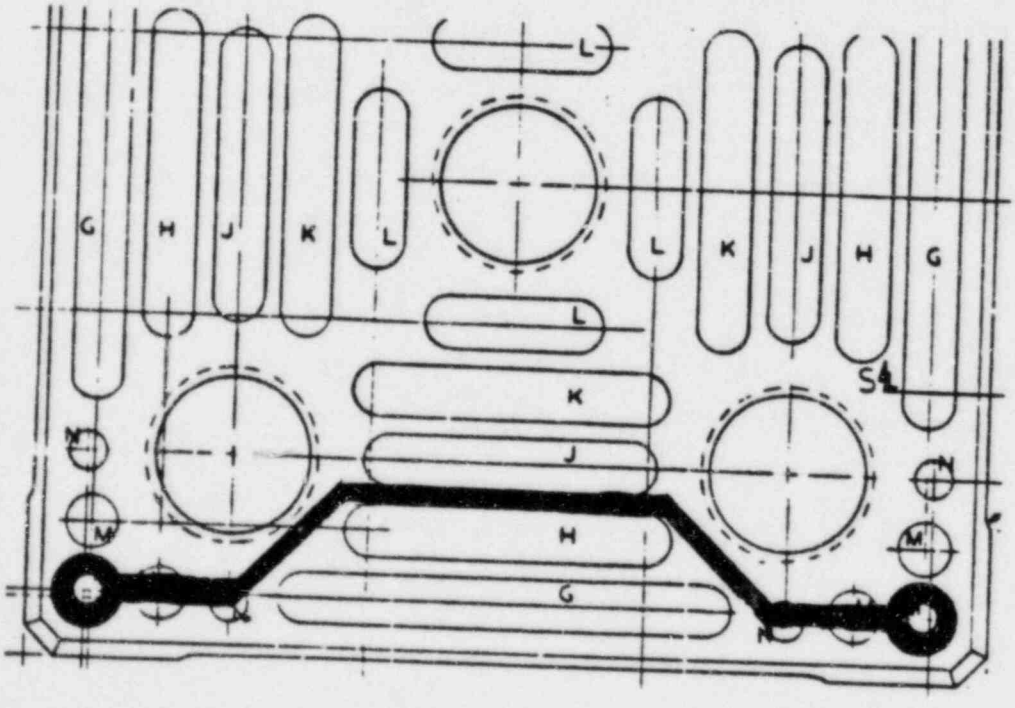
SIDE



TOP



TOP ADAPTER PLATE WITH RETENTION PLATE



MAJOR CONSIDERATIONS IN DRILL AND RIVET

* FUEL PINS REMOVED WILL BE REPLACED BY STAINLESS STEEL PINS

* PHYSICS SCOPING CRITERIA EXISTS

* THERMAL HYDRAULIC CRITERIA EXISTS

* DEVELOPMENT OF TECHNIQUE WILL ENHANCE OUR CHANCE OF SUCCESS IF RECONSTITUTION IS NECESSARY DURING AN OUTAGE

FUEL ASSEMBLY/FUEL PIN COMPATIBILITY

* W HAS ANALYZED ALL CE FUEL TYPES AND CORE CONFIGURATIONS. METHODS AND RESULTS ARE DOCUMENTED IN THE W BASIC SAFETY REPORT AND RELOAD SAFETY EVALUATIONS

  - INCLUDES ALL CE CORES AND VARIOUS MIXES

* THE COMPATIBILITY OF THE TWO DESIGNS IS DISCUSSED IN THE BSR AND THE DESIGNS ARE CONSIDERED EQUIVALENT

* THE REPLACEMENT CAGES ARE THE SAME AS THOSE PREVIOUSLY UTILIZED AT MILLSTONE UNIT 2

* THE FUEL PINS ARE MECHANICALLY IDENTICAL

SUMMARY OF IMPORTANT PARAMETERS

ATTRIBUTE	CE	W
PELLET DIAM.	0.3795/.3765	.3805
PELLET DENSITY	95.0/94.75	95.0
CLAD OD	0.440/0.440	0.440
CLAD THICKNESS	0.026/0.028	0.026
STACK HEIGHT	136.7/136.7	136.7
GRID BLOCKED AREA %	22/22	20
UPPER NOZZLE BLOCKED AREA %	57/57	56

RADIOLOGICAL CONCERNS/EXPERIENCE

* CONCERNS

  - ROUTINE RADIATION EXPOSURE
  - SPENT FUEL POOL CONTAMINATION
  - INCIDENT ASSESSMENT

* DESCRIPTION OF OPERATIONS

  - GENERAL FUEL HANDLING
  - FUEL ASSEMBLY HANDLING/RECONSTITUTION
  - FUEL PIN HANDLING/TESTING

* EXPERIENCE BASE WITHIN NUSCO AND CE

  - RECONSTITUTION OF 106 FUEL ASSEMBLIES IN THE EARLY 1970'S

  - RECONSTITUTION OF GE STR FUEL ASSEMBLY EACH OUTAGE FOR 8 YEARS - INCLUDING RECENT OUTAGE

- FUEL PIN FAILURE INVESTIGATIONS IN 1983 AND 1984. INCLUDED 162 ROD MANIPULATIONS AND 2 END CAP REMOVALS.

- POOLSIDE EXAMINATIONS OF MULTIPLE FUEL ASSEMBLIES IN 1978 AND 1979

- RECONSTITUTED IN EXCESS OF 100 FUEL ASSEMBLIES UTILIZING BOTH METHODS SINCE THE MID 1970'S

ALARA/HEALTH PHYSICS CONTROLS

* PLANT DESIGN CHANGE REQUEST ADDRESSES ALARA CONCERNS PRIOR TO APPROVAL

  - MAN-HOURS FOR JOB 14000
  - EXPECTED MAN REM FOR JOB 15-20

* PROCEDURES ADDRESS HEALTH PHYSICS RESTRICTIONS AND LIMITATIONS

  - FULL-TIME HEALTH PHYSICS TO BE UTILIZED
  - RESPONSE TO INCIDENT WILL BE DEFINED
  - ROD LIFTS ARE RESTRICTED BY PROCEDURE

    - 100 LB. BREAK-AWAY
    - 25 LB. NORMAL
    - NOT MORE THAN A SINLGE ROD OUT
    - RESTRICTED FROM MOVING SEVERLY DAMAGED ROD WITHOUT ADDITIONAL PROCEDURES

- MINIMUM SHIELDING DEFINED IN PROCEDURES
- TRAINING FOR ALL PERSONNEL INVOLVED
- PROCEDURES WILL BE APPROVED BY THE PLANT OPERATIONS REVIEW COMMITTEE

INCIDENT/ACCIDENT

* FUEL HANDLING ACCIDENT BOUNDS THE PROBABLE SCENARIOS

* ONLY 20 FUEL ASSEMBLIES BEING HANDLED WHICH IS LESS THAN A NORMAL REFUELING

FUEL PIN MANIPULATIONS

* APPROXIMATELY 3500 MANIPULATIONS EXPECTED
* BETWEEN 1 AND 5 BROKEN RODS EXPECTED
  - BROKEN RODS WILL MOST LIKELY BE PREVIOUSLY FAILED RODS, THUS NO GAS INVENTORY
  - PROCEDURE LIMITS ROD LIFT FORCES
  - PROCEDURE RESTRICTS MANIPULATION OF DAMAGED RODS
  - BROKEN ROD CONTAINERS WILL BE AVAILABLE
  - SNM ACCOUNTABILITY/RECOVERY PROCEDURES WILL BE REQUIRED

* RADIOLOGICAL ASSESSMENT HAS PERFORMED A CALCULATION FOR SINLGE PIN FAILURE WITH GAS INVENTORY

  - CLASSIFIED AS AN UNPLANNED RADIOACTIVE GAS RELEASE (UNUSUAL EVENT/ DELTA TWO)

  - DOSE TO INDIVIDUAL 3 MR

  - DOSE TO PUBLIC < 0.1 MR

* FUEL PIN BREAKAGE PROBABILITY IS SMALL

  - 100 LB. BREAKAWAY LIMIT 3200 PSI

  - 25 LB. PULLING LIMIT 800 PSI

  - ZIRCALOY YIELD 30K - 50K PSI

  - ZIRCALOY ALLOWABLES 18K - 20K PSI

MEETING SUMMARY DISTRIBUTION

Licensee: Northeast Nuclear Energy Company

*Copies also sent to those people on service (cc) list for subject plant(s).

Docket File
NRC PDR
L PDR
ORB#3 Rdg
Project Manager - DOsborne
JMiller
BGrimes (Emerg. Preparedness only)
OELD
NSIC
EJordan, IE
JNGrace, IE
ACRS-10

NRC Meeting Participants:

DOsborne
LPhillips
RLobel
JMinns
SBlock