

AUG 13 1982

MEMORANDUM FOR: Thomas A. Ippolito, Acting Assistant  
 Director for Safety Assessment  
 Division of Licensing

THRU: Gary M. Holahan, Acting Chief  
 Operating Reactors Assessment Branch  
 Division of Licensing

FROM: Robert E. Martin, Acting Section Leader  
 Engineering Section  
 Operating Reactors Assessment Branch  
 Division of Licensing

SUBJECT: MEETING WITH STEAM GENERATOR OWNERS GROUP  
 REGARDING PROPOSED STEAM GENERATOR GENERIC  
 REQUIREMENTS

Attached is a summary of the subject meeting that was held on July 29, 1982 in Bethesda. The staff presented the proposed requirements and invited an SGOG assessment of the value/impact of the proposed requirements. A list of attendees and copies of the slides and the handout used during the meeting are shown in the Enclosures to the summary.

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 Robert E. Martin, Acting Section Leader  
 Engineering Section  
 Operating Reactors Assessment Branch  
 Division of Licensing

DESIGNATED ORIGINAL

Certified By Carolyn Inlon

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DATE	8/14/82	8/12/82					

MEETIN SUMMARY DISTRIBUTION

AUG 13 1982

NRC/PDR  
Local PDR  
H. Denton  
E. Case  
R. Purple  
B. Youngblood  
A. Schwencer  
F. Miraglia  
J. Miller  
R. Vollmer  
J.P. Knight  
R. Bosnak  
R. Schauer  
R.E. Jackson  
IE (3)  
ACRS (16)  
I. Novak  
N. Hughes  
J. Reiland  
R. Jacobs  
G. Lear  
W. Hazelton  
Z. Roszcztochy  
W. Haass  
D. Muller  
R. Ballard  
W. Regan  
P. Check  
O. Parr  
F. Rosa  
W. Butler  
W. Kreger  
R. Houston  
W. Gammill  
L. Rubenstein  
T. Speis  
T. Murley  
F. Schroeder  
D. Skovholt  
M. Ernst  
K. Kniel  
G. Knighton  
A. Thadani  
D. Tondi  
J. Kramer  
D. Vassallo  
P. Collins  
D. Ziemann  
F. Congel  
J. Stolz  
M. Srinivasan

W. Minners  
C. Berlinger  
E. Adensam

NRC Participants:

D. Eisenhut  
R. Mattson  
S. Hanauer  
G. Lainas  
W. Johnston  
V. Benaroya  
T. Ippolito  
K. Wichman  
L. Phillips  
P. Norian  
C. McCracken  
L. Marsh  
P. Matthews  
J. Strosnider  
E. Murphy  
R. Martin  
F. Akstulewicz  
W. Collins  
C. Jupiter  
G. Igne  
L. Frank  
T. Sullivan  
H. Conrad  
B. Mann  
A. Patton  
R. Ramirez  
R. Urban  
R. Rodriguez

SAI - Staff Consultants

J. Moorehouse  
R. Belanger  
J. Stokeley  
M. Gross  
F. Wimpey  
B. Horton  
R. Liner  
B. Johnson  
M. Spaeth  
G. Freund  
L. Parker

SGOG and Utilities

R. Schmidt  
L. White  
R. Acosta  
T. Tramm  
R. Shell  
T. Ziegler  
D. Adams  
L. Parscale  
D. Love  
B. Snow  
B. Layman  
A. Curtis  
R. McCredy  
A. Suddith  
S. Brown  
J. Lang  
S. Green

Others

J. Nelson  
O. Williams  
L. Conner  
N. Chapman  
R. Mattu  
K. Atwood  
P. Delozier  
J. Renehan  
E. Murphy  
A. Bivens  
J. Berga  
B. Layman  
W. Brown  
J. Gaunt  
J. Yacker  
M. Kamimura  
M. Takahashi

SUMMARY OF JULY 29, 1982 MEETING WITH  
STEAM GENERATOR OWNERS GROUP (SGOG) REGARDING  
PROPOSED GENERIC REQUIREMENTS

On Thursday, July 29, 1982 the NRC staff met with representatives of the SGOG in Bethesda, Maryland for the purpose of discussing proposed additional steam generator generic requirements. Copies of the slides used by the NRC staff, the information package distributed during the meeting and a list of the attendees are enclosed.

The staff described the ongoing program to develop additional requirements related to steam generator integrity and the mitigation of the consequences of steam generator tube rupture (SGTR) accidents. The program is based on the staff's perception of the need to consider issues related to the resolution of the Unresolved Safety Issues A-3, A-4 and A-5 regarding steam generator tube integrity, the January 25, 1982 SGTR at the R.E. Ginna plant as discussed in NUREG-0909 and NUREG-0916, three previous domestic SGTR's as discussed in NUREG-0651 and plant specific operating experience including various degradation mechanisms, tube leaks and plugging history as discussed in NUREG-0886 and in various plant specific licensing actions.

The staff addressed the proposed requirements, as set forth in the handout, as representing the staff's current views on the respective subjects. The staff identified the purpose of the meeting as an opportunity to present the proposed requirements and to solicit responses from the SGOG regarding the value/impact of the proposed requirements.

The meeting discussions consisted largely of the staff's presentation of the information contained in the attached slides and handout with a limited response from other attendees based on their having been first presented with a description of the proposed requirements at the meeting. At the conclusion of the meeting, the SGOG indicated that they planned to offer a written response within about two months. This schedule was somewhat beyond the staff's desired schedule for the staff development of value/impact considerations; therefore the staff and SGOG agreed to meet again in about three weeks to consider the status of the SGOG responses at that time.

*Robert E. Martin*

Robert E. Martin  
Operating Reactors Assessment Branch  
Division of Licensing

ATTENDANCE LIST

JULY 29, 1982

NRC Participants\*

D. Eisenhut  
R. Mattson  
S. Hanauer  
G. Lainas  
W. Johnston  
V. Benaroya  
T. Ippolito  
K. Wichman  
L. Phillips  
P. Norian  
C. McCracken  
L. Marsh  
P. Matthews  
J. Strosnider  
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G. Igne  
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M. Gross  
F. Wimpey  
B. Horton  
R. Liner  
B. Johnson  
M. Spaeth  
G. Freund  
L. Parker

SGOG and Utilities

R. Schmidt, FP&L  
L. White, RG&E  
R. Acosta, FP&L  
T. Tramm, Comm. Ed.  
R. Shell, TVA  
T. Ziegler, TVA  
D. Adams, TVA  
L. Parscale, AP&L  
D. Love, AP&L  
B. Snow, RG&E  
B. Layman, RG&E  
A. Curtis, RG&E  
R. McCredey, RG&E  
A. Suddith, DPC  
S. Brown, ERRI/NDE  
J. Lang, EPRI/SGPO  
S. Green, EPRI/SGPO

Others

J. Nelson, QUADREX  
O. Williams, Nutech Engineers  
L. Conner, NRC Calendar  
N. Chapman, Bechtel  
R. Mattu, NUS  
K. Atwood, NUS  
P. Delozier, NUS  
J. Renehan, NUS  
E. Murphy, Westinghouse  
A. Bivens, AIF  
J. Berga, EPRI  
B. Layman, EPRI/NSAC  
W. Brown, INPO  
J. Gaunt, U.K. CEGB  
J. Yacker, Nucleonics Week  
M. Kaminura, OEISI  
M. Takahashi, OEISI

\*Many attended only a portion of the meeting.

PURPOSE OF MEETING

PRESENT PROPOSED REQUIREMENTS TO OBTAIN INDUSTRY FEEDBACK  
RELATIVE TO VALUE IMPACT.

## BACKGROUND

- UNRESOLVED SAFETY ISSUES, A-3, A-4, A-5 (1977)
- GINNA SGTR (NUREG-0909 AND NUREG-0916)
- PLANT SPECIFIC OPERATING EXPERIENCE
  - DEGRADATION MECHANISMS, TUBE LEAKS PLUGGING, HISTORY, ETC. SUMMARIZED IN NUREG-0886
  - PLANT SPECIFIC LICENSING ACTIONS

## I. PROPOSED REQUIREMENTS

### ● STEAM GENERATOR INTEGRITY

- PREVENT/DETECT LOOSE PARTS/FOREIGN OBJECTS
- STABILIZE/MONITOR DEGRADED TUBES
- TUBE ISI PROGRAM
- IMPROVED ECT TECHNIQUES
- PRIMARY/SECONDARY LEAKAGE LIMITS
- SECONDARY WATER CHEMISTRY
- CONDENSER ISI PROGRAM
- UPPER INSPECTION PORTS

### ● PLANT SYSTEMS RESPONSE

- RCS PRESSURE CONTROL DURING SGTR
- SI RESET
- CI RESET

### ● RADIOLOGICAL CONSEQUENCES

- STS LIMIT FOR IODINE ACTIVITY

## II.1 PREVENTION AND DETECTION OF LOOSE PARTS AND FOREIGN OBJECTS

### REQUIREMENT

- S.G. SECONDARY SIDE INSPECTION ABOVE TUBESHEET OF ENTIRE PERIPHERY (AND TUBE LANE) FOR LOOSE PARTS, FOREIGN OBJECTS AND TUBE O.D. DAMAGE.
- IMPROVE QA/QC PROCEDURES TO PRECLUDE INTRODUCTION OF FOREIGN OBJECTS INTO SG PRIMARY/SECONDARY SIDES.
- INSTALL AND OPERATE SG LPMS ON PRIMARY AND SECONDARY SIDE IN CONFORMANCE WITH RG 1.133 GUIDANCE.

### BASES

- FOREIGN OBJECTS OR LOOSE PARTS DISCOVERED IN S.G. PRIMARY OR SECONDARY SIDES OF: PRAIRIE ISLAND 1, GINNA, ZION 1, NORTH ANNA 1, SAN ONOFRE 1, DAVIS-BESSE, RANCHO SECO, OCONEE 3, AND TURKEY POINT 4.
- SIGNIFICANT TUBE DAMAGE FROM LOOSE PARTS AND FOREIGN OBJECTS HAS OCCURRED.
- DEFICIENCIES IN QA/QC DURING SG INSPECTION AND MAINTENANCE ALLOWED UNDETECTED FOREIGN OBJECTS.
- LPMS FOR SG COULD HAVE AVERTED THE TUBE RUPTURES AT PRAIRIE ISLAND AND GINNA AND PREVENTED TUBE DAMAGE AT OTHER UNITS WITH FOREIGN OBJECTS AND LOOSE PARTS.
- LPMS CAPABLE OF DETECTING OBJECTS  $\geq 1/4$  LB.

## II.2 STABILIZATION AND MONITORING OF DEGRADED TUBES

### REQUIREMENT

- LICENSEES SHALL PREPARE AND SUBMIT A REPORT THAT:
  - IDENTIFIES PROGRESSIVE DEGRADATION MECHANISMS CURRENTLY PRESENT OR LIKELY TO OCCUR IN THEIR PLANT.
  - CONTAINS CRITERIA AND PROCEDURES FOR (1) MONITORING OF PLUGGED NON-LEAKING TUBES FOR WHICH RATES OF PROGRESSIVE DEGRADATION ARE UNPREDICTABLE, AND (2) STABILIZATION OF DEGRADED TUBES WITH POTENTIAL FOR SEVERANCES AND DAMAGE TO ADJACENT TUBES.

### BASES

- PLUGGED TUBES CAN DEGRADE FURTHER AFTER PLUGGING.
- PROGRESSIVE DEGRADATION OF CONCERN IS THAT POTENTIALLY AFFECTING ENTIRE TUBE CIRCUMFERENCE (E.G., CIRCUMFERENTIAL FATIGUE CRACKS AND FRETTING WEAR DUE TO FLOW INDUCED VIBRATION).
- LIMITED LEAKAGE PLUGS TO MONITOR RATE OF FRETTING WEAR HAVE BEEN USED AT RINGHALS-3 (SWEDEN) FOR MODEL D3 SG.
- RECENTLY, LIMITED LEAKAGE PLUGS TO MONITOR POTENTIAL DEGRADATION OF "LIVE" TUBES SURROUNDING DAMAGED TUBES WERE USED AT TURKEY POINT 4.
- CIRCUMFERENTIALLY CRACKED TUBES IN 14TH AND 15TH TSP INSPECTION LANE REGIONS IN OTSG'S HAVE BEEN STABILIZED WITH SOLID RODS ATTACHED TO SOLID PLUGS.

## 11.3 TUBE ISI PROGRAM

### ITEM

- COLD LEG SIDE TO BE INCLUDED IN INSPECTION
- MAX. INSPECTION INTERVAL TO BE 48 MOS. FOR EACH S.G.
- SPECIAL SUBSETS OF TUBES MAY BE DEFINED
- IF  $>1$  DEFECTIVE OR  $>5\%$  DEGRADED TUBES EITHER:
  - DO 100% INSPECTION, OR
  - DO INSPECTION BASED ON STATISTICALLY DETERMINED SAMPLING PLAN
- ADD DENTING INSPECTIONS TO ISI PROGRAM
- TUBE INSPECTIONS TO BE CONDUCTED IN RESPONSE TO REPAIR OF ANY LEAKS
- DENTING ACCEPTANCE LIMITS TO BE INCLUDED IN TS
- REPORT INSPECTION RESULTS TO NRC PRIOR TO OPERATION IF RESULTS EXCEED PLUGGING LIMITS

### BASES

- COLD LEG SIDE ALSO SUBJECT TO DEGRADATION
- CURRENTLY ALLOWABLE MAX. INTERVALS OF 80 TO 160 MOS. EXCESSIVELY LONG
- TO ALLOW AVOIDANCE OF EXCESSIVE INSPECTION OF TUBES NOT EXPERIENCING DEGRADATION
- TO ENSURE THAT NO MORE THAN MAX. TOLERABLE NO. FAILED TUBES GO UNDETECTED
- SURVEILLANCE OF DENTING NECESSARY TO PREVENT SCC
- EVEN SMALL LEAKS MAY INDICATE NEW PHENOMENA OR ACCELERATED DEGRADATION
- REQUIRED TO IMPLEMENT SURVEILLANCE OF DENTING
- SAMPLING REQUIREMENTS NECESSITATE REVISIONS TO REPORTING REQUIREMENTS

## II.4 IMPROVED EDDY CURRENT TECHNIQUES

### REQUIREMENT

- USE ECT OR DATA EVALUATION TECHNIQUES FOR SG ISI THAT ELIMINATE UNWANTED SIGNAL INTERFERENCES (E.G., TSP, DENTING).
- USE EC PROBES WITH ABSOLUTE AND DIFFERENTIAL INSPECTION CAPABILITY.
- INCLUDE DIFFERENTIAL AND ABSOLUTE DATA IN EC OVERALL DATA EVALUATION PROGRAM.
- IN ADDITION TO THE SECTION XI STANDARD USE A SIMULATED WEAR CALIBRATION STANDARD TO ENSURE A CONSERVATIVE INTERPRETATION OF SIGNALS FROM POSSIBLE WEAR OR FRETTING TYPE FLAWS.

### BASES

- LAB AND FIELD EXPERIENCE DEMONSTRATE SUPERIORITY OF MULTIPLE ECT TO ELIMINATE UNWANTED SIGNAL INTERFERENCES.
- ECT IN ABSOLUTE MODE IN ADDITION TO DIFFERENTIAL MODE IMPROVES DEFECT DETECTION AND INTERPRETATION CAPABILITIES.
- WEAR DEFECTS GENERALLY DETECTED ON ABSOLUTE CHANNELS BUT MAY NOT PRODUCE SIGNALS ON DIFFERENTIAL CHANNELS. WEAR CALIBRATION STANDARD CONSIDERED NECESSARY.
- THE TUBE WHICH RUPTURED AT GINNA EXHIBITED NO DIFFERENTIAL SIGNAL DURING PREVIOUS ECT OF TUBE IN APRIL 1981. THIS TUBE DID EXHIBIT ABSOLUTE INDICATION INTERPRETABLE AS <20% USING SECTION XI CALIBRATION STANDARDS, AND >40% USING WEAR CALIBRATION STANDARD.

## II.5 PRIMARY TO SECONDARY LEAKAGE LIMIT

### REQUIREMENT

- REVISE TECH SPECS FOR PRIMARY TO SECONDARY LEAK RATE LIMITS CONSISTENT WITH APPLICABLE STS.

### BASES

- STS PRIMARY TO SECONDARY LEAK RATE LIMITS BASED ON:
  - 1 GPM TOTAL SG LEAKAGE LIMITS RESTRICTS DOSE TO SMALL FRACTION OF 10 CFR PART 100 FOR SGTR OR MSLB.
  - 500 GPD (0.34 GPM) LEAKAGE LIMIT/SG MAINTAINS TUBE INTEGRITY UNDER MSLB OR LOCA.
- PRIMARY TO SECONDARY LEAK RATE LIMITS INDICATE:
  - PRESENCE AND/OR RATE OF TUBE DEGRADATION.
  - WHEN SHUTDOWN, ISI AND CORRECTIVE ACTIONS ARE REQUIRED.

## II.7 SECONDARY WATER CHEMISTRY PROGRAM

### REQUIREMENT

- A REQUIREMENT FOR A SECONDARY WATER CHEMISTRY PROGRAM TO MINIMIZE SG TUBE DEGRADATION SHALL BE SPECIFIED IN LICENSE CONDITIONS.
- THE PROGRAM SHALL BE DEFINED IN SPECIFIC PLANT PROCEDURES BUT NOT SPECIFICALLY INCLUDED IN THE LICENSE.
- THE PROGRAM SHALL ADDRESS MEASURES TO MINIMIZE SG CORROSION (I.E., MATERIALS SELECTION, CHEMISTRY LIMITS AND CONTROL METHODS, CORRECTIVE ACTIONS FOR OUT OF SPEC CONDITIONS).
- REVISED SRP 5.4.2.1 PROVIDES STAFF REVIEW CRITERIA AND INCORPORATES "PWR SECONDARY WATER CHEMISTRY GUIDELINES" OF SEPTEMBER 1981 PREPARED BY THE SGOG.
- OPERATING PLANTS WHICH ARE SHUTDOWN TO EFFECT STEAM GENERATOR REPAIRS AS A CONSEQUENCE OF CORROSION WILL BE REQUIRED TO COMMIT TO THE REVISED WATER CHEMISTRY GUIDELINES PRIOR TO RESTART.

### BASES

- IMPROVED SECONDARY WATER CHEMISTRY IS RECOGNIZED BY BOTH INDUSTRY AND NRC AS IMPORTANT IN REDUCING SG MATERIALS CORROSION.
- THIS PROGRAM WILL ASSURE UNIFORMITY, CONSISTENCY AND REDUCE SG REPAIR AND OTHER ACTIVITIES RESULTING IN OCCUPATIONAL EXPOSURE AND THE POTENTIAL FOR RELEASES TO THE ENVIRONMENT.

## II.8 CONDENSER INSERVICE INSPECTION PROGRAM

### REQUIREMENT

- EXCEEDANCE OF SECONDARY WATER CHEMISTRY LIMITS WHICH SHOULD RESULT IN POWER REDUCTIONS TWICE PER QUARTER DUE TO CONDENSER LEAKAGE, REQUIRES A LICENSE CONDITION (SIMILAR TO II.7) THAT COMMITS TO PERFORM CONDENSER ISI.
- THE CONDENSER ISI PROGRAM SHALL BE INCLUDED IN THE PLANT OPERATING PROCEDURES.
- OPERATING PLANTS WHICH ARE SHUTDOWN TO EFFECT STEAM GENERATOR REPAIRS AS A CONSEQUENCE OF CORROSION WILL BE REQUIRED TO COMMIT TO THE REVISED CONDENSER PROGRAM PRIOR TO RESTART.

### BASES

- CONDENSER INTEGRITY IS ESSENTIAL TO MAINTENANCE OF GOOD WATER CHEMISTRY.
- CONDENSER OPERATING EXPERIENCE (EPRI-NP-481) SHOWS THAT AIR AND WATER INLEAKAGE CAN CAUSE DEGRADATION OF SG TUBES.
- CONDENSER ISI IS REQUIRED ONLY IF THERE ARE REPEATED INDICATIONS THAT SATISFACTORY SECONDARY WATER CHEMISTRY CANNOT BE MAINTAINED.

## II.9 UPPER INSPECTION PORTS

### REQUIREMENT

- PLANTS WITH U-TUBE SG'S LICENSED AFTER JANUARY 1, 1983 SHALL INSTALL UPPER INSPECTION PORTS TO ENABLE VISUAL INSPECTION OF UPPER TSP AND INNER ROW U-BEND TUBES.
- UPPER INSPECTION PORT INSTALLATION FOR OPERATING PLANTS WILL BE EVALUATED ON CASE-BY-CASE BASIS.

### BASES

- SG'S GENERALLY HAVE ONLY LOWER INSPECTION PORTS.
- PLANTS HAVE INSTALLED UPPER PORTS (AT UPPER TSP) WHICH ENABLES EVALUATION OF DENTING IN UPPER PART OF SG, FACILITATES TUBE REMOVAL FOR EXAMINATION, AND ALLOWS MONITORING OF UPPER TSP FLOW SLOT HOURGLASSING.
- DUE TO IMPACT OF EXTENDED OUTAGES AND ALARA CONSIDERATIONS, THE NEED FOR BACKFIT TO ANY OPERATING UNIT WILL BE BASED ON CASE-BY-CASE REVIEWS OF THE SG OPERATING EXPERIENCE.

### III.1.1 RCS PRESSURE CONTROL DURING A SGTR

#### REQUIREMENT

- DETERMINE OPTIMAL MEANS OF CONTROLLING AND REDUCING PRESSURE EMPHASIZING USE OF EXISTING EQUIPMENT.
- OPTIMIZE PROCEDURES, TECHNIQUES AND SYSTEMS.
- CONSIDER USAGE OF PORV AND AUXILIARY SPRAY SYSTEMS.
- OBJECTIVES: MINIMIZE LEAKAGE, MAXIMIZE PRESSURE CONTROL, MINIMIZE VOIDS IN RCS.

#### BASES

- FOUR SGTR'S HAVE DEMONSTRATED DIFFICULTY IN MANAGING RCS PRESSURE.
- WITH LOSS OF PRESSURIZER SPRAY (RCP TRIP OR LOOP) RCS DEPRESSURIZATION IS MORE DIFFICULT.
- PRESSURE CONTROL WITH PORV LOSES COOLANT AND MAY RESULT IN VOID FORMATION THUS FURTHER COMPLICATING PRESSURE CONTROL.

### III.1.3.1 SAFETY INJECTION SIGNAL RESET

#### REQUIREMENT

- REVIEW LOGIC FOR ESF EQUIPMENT TO MINIMIZE LOSS OF FUNCTION UPON RESET OF SI.
- EXAMPLE: CONSIDER SWITCHOVER OF SI PUMP SUCTION FROM BAST TO RWST INDEPENDENT OF SI RESET.

#### BASES

- NEED TO PREVENT LOSS OF SI PUMP FUNCTION.
- GINNA DESIGN POSSIBLY IMPROVED BY MAKING SWITCHOVER DEPENDENT ONLY ON BAST LEVEL, NOT ON SI RESET STATUS.

### III.1.3.2 CONTAINMENT ISOLATION AND RESET

#### REQUIREMENT

- REVIEW AND EVALUATE RESPONSE OF LETDOWN SYSTEM TO CI AND RESET SIGNALS.

#### BASES

- TO PRECLUDE UNNECESSARY RELEASES OF REACTOR COOLANT FOLLOWING RESET OF CI.

#### V.1.4 STANDARD TECHNICAL SPECIFICATION LIMIT FOR COOLANT IODINE ACTIVITY

##### REQUIREMENT

- PLANT TECH SPECS FOR COOLANT ACTIVITY LIMITS THAT DIFFER IN IODINE LIMITS OR SURVEILLANCE REQUIREMENTS FROM THE STS SHALL INCORPORATE THE STS REQUIREMENTS.
- PLANTS WITH LOW LEAD HPSI PUMPS THAT DO NOT HAVE IODINE LIMITS EQUAL TO STS VALUES WILL BE REQUIRED TO IMPLEMENT THE REDUCED IODINE TECHNICAL SPECIFICATIONS REQUIRED FOR GINNA.

##### BASES

- SOME PLANTS DO NOT HAVE LIMITS ON RADIOIODINE BUT LIMIT GAMMA ACTIVITY. TOTAL COOLANT ACTIVITY COULD REMAIN BELOW SHUTDOWN VALUE WHILE RADIOIODINE LEVELS COULD BE HIGH. IODINE SPIKING MUST BE ACCOMODATED AND CONTROLLED WITH SURVEILLANCE PROVISIONS.
- THE STS INCORPORATE DOSE EQUIVALENT IODINE CONCENTRATIONS FOR ALL PWR'S THAT (1) HAVE APPROPRIATE CONSERVATIVE LIMITS (2) ACCOMODATE AND CONTROL IODINE SPIKING AND (3) HAS ADEQUATE SURVEILLANCE FOR PRIMARY AND SECONDARY COOLANTS.
- IMPLEMENTATION OF ABOVE REQUIREMENTS PROVIDES ASSURANCE THAT WITH STEAM GENERATOR TUBE RUPTURE EVENTS, THE RADIOLOGICAL CONSEQUENCES SHOULD BE LESS THAN STAFF GUIDELINES.

## NRC PROPOSED ACTIONS

### ● STEAM GENERATOR INTEGRITY

- TUBE SLEEVING GUIDANCE ON DESIGN, INSTALLATION AND INSPECTION.

### ● PLANT SYSTEMS RESPONSE

- SG OVERFILL POTENTIAL AND CONSEQUENCES TO BE FURTHER EVALUATED.
- PRESSURIZED THERMAL SHOCK PROGRAM, TAP A-49, TO CONSIDER GINNA SGTR TRANSIENT DATA.
- IMPROVED ACCIDENT MONITORING (REG. GUIDE 1.97) IMPLEMENTATION WILL ADDRESS ASPECTS OF GINNA SGTR.
- REACTOR VESSEL INVENTORY MEASUREMENT (TMI TAP II.F.2, "INSTRUMENTATION FOR DETECTION OF INADEQUATE CORE COOLING") IMPLEMENTATION WOULD IMPROVE MONITORING OF BUBBLE IN R.V. HEAD.

### ● HUMAN FACTORS CONSIDERATION

- RCP TRIP (TMI TAP II.K.3.5) IMPLEMENTATION SHOULD PROVIDE CONTINUED FORCED RCS FLOW THROUGH DESIGN BASIS SGTR.
- CONTROL ROOM DESIGN REVIEW PROGRAM (TMI TAP I.D.1) TO CONSIDER GINNA SGTR EXPERIENCE.
- PROCEDURES FOR TRANSIENTS AND ACCIDENTS PROGRAM (TMI TAP I.C.1) TO CONSIDER GINNA SGTR AND OTHER SGTR EXPERIENCES.

### ● RADIOLOGICAL CONSEQUENCES

- REASSESS CONSEQUENCES OF SGTR.
- REEVALUATE SGTR DESIGN BASIS EVENT.
- SECONDARY SYSTEM ISOLATION.

### ● NRC ORGANIZATION RESPONSE

- INCLUDES NRC STAFF ACTIONS TO IMPROVE RESPONSE OF NRC TEAMS TO AN EVENT.
- INCLUDES NRC STAFF ACTIONS TO IMPLEMENT REQUIREMENTS OF ONGOING PROGRAMS.