

NRC STAFF PRESENTATION

TO THE

ACRS

SUBJECT: PALISADES PRESSURED THERMAL SHOCK

DATE: DECEMBER 9, 1994

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10 CFR 50.61 RT_{PTS} EVALUATION

RT_{PTS} SCREENING CRITERIA PER 10 CFR 50.61

-270 °F FOR AXIAL WELDS AND PLATES

-300 °F FOR CIRCUMFERENTIAL WELDS

$$RT_{PTS} \text{ VALUE} = I + M + \Delta RT_{PTS}$$

I = INITIAL REFERENCE TEMPERATURE (RT_{NDT}) OF THE UNIRRADIATED MATERIAL.

-MEASURED VALUES MUST BE USED IF AVAILABLE.

-IF GENERIC VALUE NOT AVAILABLE, GENERIC MEAN VALUES MUST BE USED

M = MARGIN TO COVER UNCERTAINTIES IN THE VALUES OF INITIAL RT_{NDT}, COPPER AND NICKEL CONTENTS, FLUENCE AND THE CALCULATION PROCEDURES.

ΔRT_{PTS} = MEAN VALUE OF THE ADJUSTMENT IN REFERENCE TEMPERATURE CAUSED BY IRRADIATION AND IS A FUNCTION OF NEUTRON FLUENCE, PERCENT COPPER AND PERCENT NICKEL

-CALCULATED USING SURVEILLANCE DATA

-IF SURVEILLANCE DATA IS UNAVAILABLE, THE ADJUSTMENT IN REFERENCE TEMPERATURE MAY BE CALCULATED FROM TABLES USING THE BEST-ESTIMATE PERCENT COPPER AND NICKEL

PALISADES PTS

SINCE THE SURVEILLANCE WELD MATERIAL IN PALISADES IS NOT THE SAME AS THE BELTLINE WELDS, THE LICENSEE MUST DETERMINE THE EFFECT OF RADIATION USING NUCLEAR INDUSTRY DATA

THE STAFF MET WITH THE LICENSEE ON MARCH 9, 1994 TO DISCUSS THE LICENSEES PROGRAM FOR FURTHER EVALUATION OF THE CRITICAL WELDS IN THEIR RPV

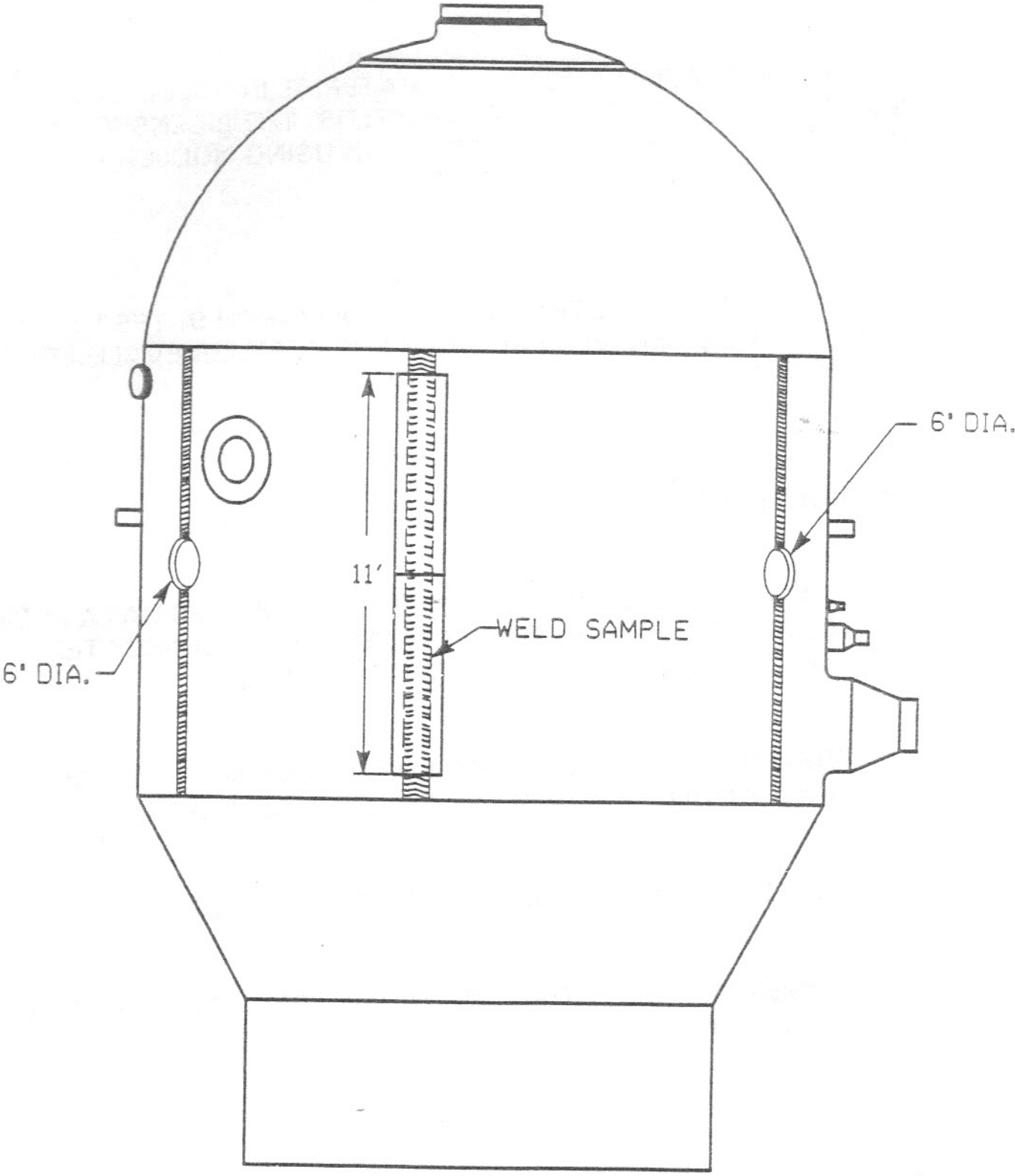
THE LICENSEE PLANNED TO:

-GATHER ADDITIONAL MATERIALS PROPERTIES DATA FROM ITS RETIRED STEAM GENERATORS (WELDS FABRICATED USING W5214 AND 34B009 WELD WIRE)

-INSTITUTE AN AUGMENTED SURVEILLANCE PROGRAM THAT WOULD CONTAIN THE LIMITING WELD METAL

-EVALUATE ANNEALING OF THE REACTOR VESSEL

-CONSIDER INSTITUTING AN "ULTRA LOW" LEAKAGE FUEL STRATEGY



PALISADES PTS cont.

STAFF ISSUED AN INTERIM SER ON JULY 12, 1994 AND ISSUED A COMMISSION PAPER AND NUREG REPORT ON RPVs ON OCTOBER 28, 1994. THESE DOCUMENTS STATED:

-BASED ON PREVIOUS NUCLEAR INDUSTRY DATA THE PALISADES REACTOR VESSEL WAS PROJECTED TO REACH THE PTS SCREENING CRITERIA IN 2004, PRIOR TO EOL, 2007

-STAFF SER NOTED THAT THE PTS EVALUATION COULD CHANGE BASED ON THE INFORMATION TO BE ACQUIRED FROM THE SG WELDS

ON NOVEMBER 1 THE LICENSEE INFORMED THE STAFF BY TELEPHONE THAT THE CHEMISTRY DATA FROM THE W5214 WELDS INDICATED HIGHER COPPER CONTENTS THAN PREVIOUSLY ASSUMED.

-EVALUATION OF THE STEAM GENERATOR WELD MATERIAL ALSO INDICATED A HIGHER INITIAL RT_{NDT} VALUE THAN THE MEAN GENERIC VALUE.

ON NOVEMBER 18 THE LICENSEE SUBMITTED THEIR ASSESSMENT OF THE IMPACT OF THESE NEW DATA ON THE RT_{PTS} VALUE. THIS ASSESSMENT INDICATES THAT PALISADES REACTOR VESSEL WOULD REACH THE PTS SCREENING CRITERIA IN 1999

STAFF MET WITH THE LICENSEE ON NOVEMBER 21, 1994 TO DISCUSS THE NEW INFORMATION.

STAFF REQUEST FOR ADDITIONAL INFORMATION SENT TO LICENSEE ON NOVEMBER 30, 1994.

STAFF EVALUATION IS SCHEDULED TO BE COMPLETED BY JANUARY 31, 1995.

PALISADES PTS cont.

THE STAFF IS CURRENTLY REVIEWING THE LICENSEE'S
NOVEMBER 18 SUBMITTAL.

CRITICAL AREA BEING ASSESSED INCLUDE:

-EFFECT OF THERMAL AGING, HEAT TREATMENT AND TEST
METHOD ON UNIRRADIATED REFERENCE TEMPERATURE

-BEST ESTIMATE CHEMICAL COMPOSITION FROM STEAM
GENERATOR AND NUCLEAR INDUSTRY DATA

DEPENDING UPON HOW THE NEW DATA ARE USED IN THE
ANALYSIS THE PTS SCREENING LIMIT COULD BE REACHED
BEFORE 1999

STAFF WILL RECEIVE TECHNICAL ASSISTANCE FROM RES
CONTRACTOR, ORNL

GENERIC IMPLICATIONS OF NEW DATA

REVIEW OF OTHER RPVs WITH PALISADES WELD MATERIAL
(i.e. W5214 or 34B009 WELD METAL)

-OTHER PLANTS STILL SATISFY PTS SCREENING CRITERIA
AND UPPER SHELF ENERGY CRITERIA

-LOWER FLUENCE OR USE OF ACTUAL SURVEILLANCE DATA

OTHER PLANTS THAT ARE PROJECTED TO BE NEAR THE PTS
SCREENING CRITERIA BEFORE END-OF-LIFE ARE BEING ASSESSED

-SENSITIVITIES BEING STUDIED

-PROACTIVE MEASURES MAY BE APPROPRIATE