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STELLO,V. Division of Operating Reactors

SUBJECT: Forwards addl info re PWR feedwater lines in response to NRC 790525 request,W/3 oversize drawings.

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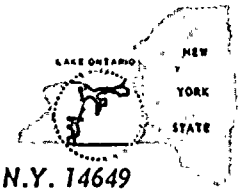

ROCHESTER GAS AND ELECTRIC CORPORATION • 89 EAST AVENUE, ROCHESTER, N.Y. 14649

LEON D. WHITE, JR.
VICE PRESIDENT

TELEPHONE
AREA CODE 716 546-2700

June 18, 1979

Mr. Victor Stello, Jr., Director
U.S. Nuclear Regulatory Commission
Division of Operating Reactors
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

Subject: Victor Stello, Jr. letter dated May 25, 1979
Information Requested on PWR Feedwater Lines
R.E. Ginna Nuclear Power Plant, Unit No. 1
Docket No. 50-244

Dear Mr. Stello:

Enclosed is a copy of our response to the subject letter.

Very truly yours,

L. D. White, Jr.

Enclosure

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7906210193

Response to Victor Stello, Jr. Letter Dated May 25, 1979
Information Requested on PWR Feedwater Lines
R.E. Ginna Nuclear Power Plant, Unit No. 1
Docket No. 50-244

Design

1. Gilbert Associates drawing D-304-083 shows plan views of the main feedwater piping to steam generators A and B inside containment. The elevation views are shown in Sections D-D and A-A on Gilbert Associates drawing D-304-084. Pipe supports FW - 1, 2, 4, 6, 10, 81, 80, 8 and 7 are spring hangers. Pipe restraints FW - 3, 5, and 9 are snubbers. There are no valves located in the main feedwater piping inside containment. Details of the pipe and fittings are contained in Gilbert Associates Line Specification No. 900-1. Copies of the drawings and line specification are enclosed.

2.(a) The results of the original piping stress analyses for Ginna Station may be found in a June 9, 1969 submittal to the AEC entitled "Additional Information on Seismic Design of Class I Piping". Additional stress analyses of the main feedwater piping inside containment were performed in 1973 and 1976. A summary of the stresses calculated in the most recent analyses is shown below:

	Thermal Stress	Pressure Stress	Deadweight Stress
SG1A Maximum	3979 psi	2858 psi	480 psi
Nozzle	1488	2858	250
SG1B Maximum	3846	2858	695
Nozzle	1184	2858	388

(b) Fatigue analyses have been performed for portions of the main steam and feedwater piping at Ginna Station. However, the main feedwater piping inside containment was not included in these analyses.

Fabrication History

1.(a) The feedwater ring and thermal sleeve material is ASTM A106 Grade B.

(b) The steam generator feedwater nozzles are SA 336, Code Case 1332, Para. 5a-5d. This material was later incorporated in the Code as SA 508 Class 2.

(c) The main feedwater piping is ASTM A106 Grade C, seamless pipe with ASTM A234 Grade WPB pipe fittings.

2.(a) Feedwater nozzle to pipe elbow welds were made using gas tungsten arc welding (GTAW) with a backing ring for the root pass and shielded metal arc welding (SMAW) for completion. The filler metal was E7018. Preheat was maintained at > 200°F and post weld heat treatment was at 1150°F ± 25°F. The weld ends were a J-groove with a 1/16 inch land as shown in detail G of drawing D-304-084.

(b) Piping welds made using GTAW with a K insert for the root pass and SMAW for completion. The filler metal was E7018. Preheat was maintained at > 75°F and post weld heat treatment at 1150°F ± 25°f. The weld ends were compound groove with a 1/16 inch land as shown on Gilbert Associates drawing B-312-003.

(c) The sparger has a thermal sleeve which is installed into the feedwater nozzle using a press fit.

3. The feedwater nozzle to elbow, elbow to reducer, and reducer to piping welds at each steam generator were radiographically examined following original fabrication. Those radiographs were recently reviewed and found acceptable as indicated in the attached letter to John C. Noon from Albert E. Curtis dated June 1, 1979.

4. The feedwater piping was fabricated to the requirements of ASA Code for Pressure Piping, B31.1-1955.

5. Feedwater piping was specified as seamless ASTM A106-64 Grade C with supplementary tests S2, S3, and S4 to be performed on both ends of one length from each heat.

Preservice/Inservice Inspection and Operating History

1. A preservice inspection in accordance with ASME B&PV Code, Section XI was not performed. Hydrostatic testing and radiographic examination of the feedwater piping welds as indicated in item B-3 above was performed.

2.(a) The B steam generator feedwater nozzle to pipe elbow weld was examined in 1976 using the magnetic particle technique and found acceptable.

(b) The 14 inch reducer to pipe weld near the B steam generator nozzle was radiographically examined in 1973 and ultrasonically examined in 1976 following water hammer and vibration problems discussed below. The welds were found to be acceptable.

3.(a) The feedwater nozzle to elbow, elbow to reducer, and reducer to pipe welds at each steam generator and the two feedwater pipe to containment penetration welds will be radiographically examined during the 1980 refueling outage. The remainder of the feedwater piping inside containment will be examined over the life of the plant as required by ASME B&PV Code Section XI.

(b) The feedwater piping welds outside containment are being inspected in accordance with the "Inservice Inspection Plan for High Energy Piping Welds at Robert E. Ginna Nuclear Power Station". All welds in this program have been previously inspected at least once. All design basis break locations will be examined once more during the 10 year inspection interval.

4.(a) Two (2) transients which could be characterized as "water hammer" have occurred in the feedwater system at Ginna Station. The first transient occurred on July 22, 1973 and was reported to the U.S. Atomic Energy Commission in a letter dated August 21, 1973 to Mr. John F. O'Leary, Director, Directorate of Licensing. The second occurred on June 17, 1975 and was reported to the U.S. Nuclear Regulatory Commission in a letter dated July 17, 1975 to Mr. Robert T. Carlson, Chief, Facilities Construction and Engineering Support Branch, Region I.

(b) Flow induced vibration of the steam and feedwater piping at Ginna Station was experienced during the first few years of plant operation. An extensive program of vibration monitoring, fatigue analysis, and modification was performed to resolve this problem. The modifications included upgrading as well as addition of pipe supports and restraints. The results of the analyses showed that the additional stresses due to flow induced vibrations could safely be accommodated by the affected piping systems.

5.(a) There have been two types of feedwater control used at Ginna Station. From startup to January 1978 hydrazine injection was used to control pH and oxygen. In 1978 a full flow deep bed polishing system was put on line and pH control was changed to NH_4OH addition.

(b) The control parameters remained essentially the same for both periods:

1.	pH	8.8-9.2
2.	dissolved oxygen	0-5 ppb
3.	N_2H_4	5-20 ppb

(c) From startup until November 1974 small condenser leaks (< 0.25 gpm) were tolerated until repairs could be made since sodium or chloride concentration increases were small (<1 ppb). From November 1974 until January 1978 all volatile treatment was used and any detectable leak (< 200 cc/min) was repaired within 24 hours. Since 1978 the polishers have been in service continuously.

4:2 Line Specifications

Line Specification No. 900-1

Rating: 1550 psig/450°F
Service: Feedwater
Steam Generator Vent Steam

Pipe

Seamless Carbon Steel, ASTM A106-64, Grade C

8" and larger - Schedule 100

6" and smaller - Schedule 80

Supplementary tests S2, S3 and S4 shall be performed on both ends of one length from each heat on all sizes 2-1/2" and larger.

Fittings

2-1/2" and larger - Carbon Steel, ASTM A234, Grade WPB, same schedule as pipe, butt weld

2" and smaller - Forged carbon steel, ASTM A234, Grade WPB, 3000 PSI, socket weld

Joints

2-1/2" and larger - Butt weld

2" and smaller - Socket weld

Flanged - Forged Carbon Steel, ASTM A105-64, Grade II,

2-1/2" and larger - 900# R.F. welding neck

2" and smaller - 1500# socket weld

Gaskets - Flexitallic gasket Style CG Type 304 SS and asbestos filler

Stud Bolts - ASTM A193-62T, Grade B7

Hex Nuts - ASTM A194-62T, Grade 2

Line Specification No. 900-1 (Cont'd.)

Valves

	2" and Smaller	2-1/2" and Larger
Rating	600 PSI	900 PSI
Ends	Socket Weld	Butt Weld
Construction	OS&Y	OS&Y
Body	ASTM A105 Grade II	ASTM A216, Grade WCB
Bonnet	Bolted	Pressure Seal
Stem	ASTM A182 Grade F6	ASTM A182, Grade F6
Seating	Stellite	Stellite

Rochester Gas and Electric Corporation

Inter-Office Correspondence

June 1, 1979

SUBJECT: Review of Feedwater Piping to Steam Generator Nozzles Radiographs

TO: Jack C. Noon, Assistant Superintendent - Ginna Station

On May 31, 1979 the radiographs of the feedwater piping to steam generator nozzle welds for both the A and B Steam Generator were reviewed to verify weld quality and that there are not any stress risers associated with original end prep, the welds reviewed were as follows and are shown on the attached Figures B-12 and B-13:

A S/G	
FW1001EE	18" elbow to nozzle
SFW1001DD10	18" elbow to reducer
SFW1001DD9	Reducer to 14" pipe
B S/G	
FW1005-BB	18" elbow to nozzle
SFW1005-AA7	18" elbow to reducer
SFW1005-AA6	Reducer to 14" pipe

The results of this review were very good. These welds are of excellent quality and the weld end preps show a smooth contour when comparing relative densities across the weld root to the end of the weld prep. Therefore, I would conclude that these welds are installed as designed and would not develop a similar problem as has been found at the D. C. Cook Nuclear Plant.

If you have any further questions, please contact me.

Albert E. Curtis III
Welding & NDE Engineer
Level III, RT

AEC:dmaE2
xc: L. D. White, Jr.
L. S. Lang
B. A. Snow
J. E. Arthur
T. R. Schuler
J. C. Hutton
C. R. Anderson
M. J. Saporito

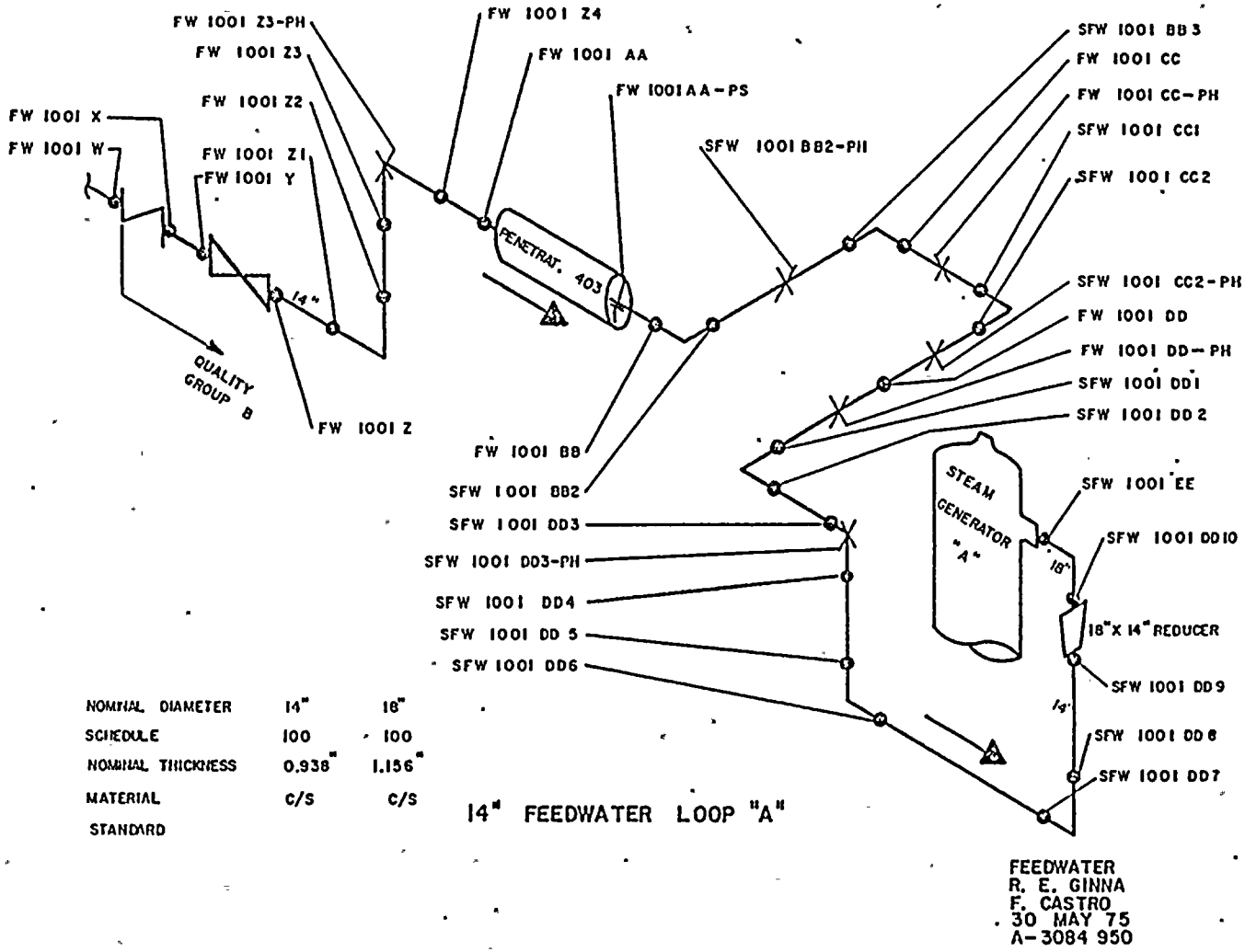
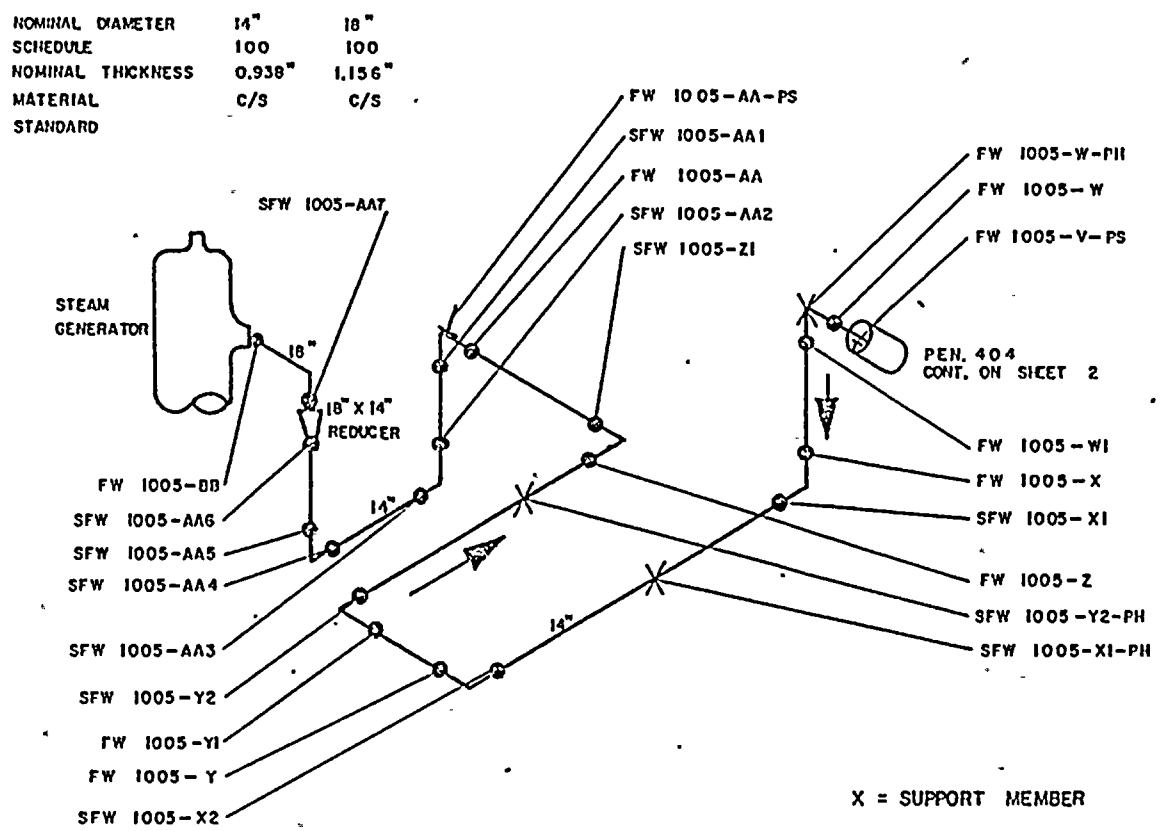

FW 1001 Z3-PH
FW 1001 Z3
FW 1001 Z2
FW 1001 Z1
FW 1001 Z4
FW 1001 AA
FW 1001 AA-PS
SFW 1001 BB2-PH
SFW 1001 BB3
FW 1001 CC
FW 1001 CC-PH
SFW 1001 CC1
SFW 1001 CC2
FW 1001 X
FW 1001 W
FW 1001 Y
PENETRAT. 403
14"
QUALITY GROUP B
FW 1001 Z
SFW 1001 CC2-PH
FW 1001 DD
FW 1001 DD-PH
SFW 1001 DD1
SFW 1001 DD2
FW 1001 BB
SFW 1001 BB2
SFW 1001 DD3
SFW 1001 DD3-PH
SFW 1001 DD4
SFW 1001 DD5
SFW 1001 DD6
STEAM GENERATOR "A"
SFW 1001 EE
SFW 1001 DD10
18"
18"X 14" REDUCER
SFW 1001 DD9
14"
SFW 1001 DD8
SFW 1001 DD7
NOMINAL DIAMETER 14" 18"
SCHEDULE 100 100
NOMINAL THICKNESS 0.938" 1.156"
MATERIAL C/S C/S
STANDARD
14" FEEDWATER LOOP "A"
FEEDWATER
R. E. GINNA
F. CASTRO
30 MAY 75
A-3084 950

FIGURE B-12



14" FEEDWATER LOOP B

INSIDE CONTAINMENT

SHEET 1 OF 2

FEEDWATER
R E. GINNA
F. CASTRO
29 MAY 75
A-3084 948

FIGURE B-13