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ROTHERT,W.C. Iowa Electric Light & Power Co.
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MURLEY,T.E. Office of Nuclear Reactor Regulation, Director (Post 870411

SUBJECT: Responds to NRC Bulletin 88-005, "Nonconforming Matls Supplied by Piping Supplies,Inc...."

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NRC BN 88-05

Iowa Electric Light and Power Company
September 12, 1988

NG-88-3088

Dr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Response to NRC Bulletin 88-05, "Nonconforming Materials Supplied by PSI at Folsom, New Jersey and WJM at Williamston, New Jersey", and Supplements 1 and 2
File: A-101a

Dear Dr. Murley:

Iowa Electric has reviewed Duane Arnold Energy Center (DAEC) purchasing records to identify pipe fittings and flanges that may have been supplied by West Jersey Manufacturing Company (WJM), Piping Supplies, Inc. (PSI), or Chews Landing Metal Manufacturers, Inc. (CLM). Thirty-eight flanges supplied by WJM were discovered. No flanges supplied by PSI or CLM were found and no pipe fittings supplied by any of these companies were found.

Twenty-one of the thirty-eight WJM flanges are located in the DAEC warehouse; thirteen are installed in safety-related systems; and four were discarded prior to issuance of Bulletin 88-05.

Six flanges were identified as being installed in the Scram Discharge Volume (SDV). The NRC Operations Center was notified at 1556 hours on June 23 that a Justification for Continued Operation (JCO) would be needed as required by Bulletin 88-05, Supplement 1. This JCO was based on an engineering evaluation of in-situ hardness testing results. Detailed chemical and tensile tests were not performed on these flanges because they were determined to be "functionally inaccessible." They are located on instrument lines that contain Reactor Protection System instrumentation. Cutting samples from the flanges for testing could have produced vibration that would cause a reactor scram. In-situ hardness testing was performed using equipment and procedures consistent with those recommended by the Nuclear Management and Resources Council (NUMARC). Three flanges (IE-22, IE-24, and IE-25) had hardness

IE11
1/1

values outside the nominal code limits for ASME SA-105 material. However, an Iowa Electric engineering evaluation determined that estimated material properties for these flanges, based on tested hardness values, are adequate for their use on the SDV.

Seven flanges were identified as being installed on Residual Heat Removal (RHR) Heat Exchangers. The NRC Operations Center was notified of this condition at 1700 hours on June 24. Another JCO was written based on results of chemical, tensile, and hardness tests performed by a qualified materials testing laboratory. Two flanges, IE-28 and IE-29, did not meet ASME SA-105 specifications. However, an Iowa Electric engineering evaluation determined that their material properties are adequate for their application.

Chemical, tensile, and hardness testing was also performed on nineteen of the twenty-one WJM-supplied flanges in the DAEC warehouse. The remaining two flanges were not tested because they were used for practicing the cutting of samples from the installed flanges, on the RHR Heat Exchanger. One flange, IE-6, was judged to be from a different heat than fifteen other flanges stated by WJM to be from the same heat (A23). It has considerably less carbon, more manganese, and traces of nickel not found in our other samples. Composition and physical properties of all other warehouse items agree with WJM-supplied values.

Table 1 of this report contains descriptions of the thirty-four WJM-supplied flanges possessed by Iowa Electric. Table 2 contains results of tensile and hardness testing of the 26 flanges for which detailed testing was performed. Table 3 contains results of chemical composition testing of the same 26 flanges. Table 4 contains results of in-situ hardness testing performed on the six SDV flanges.

Bulletin 88-05, Supplement 2 concluded that it is appropriate to suspend field measurements, testing, records review, and preparation of JCO's requested by Bulletin 88-05 and Supplement 1 until further notice. Based on Supplement 2 information, we do not intend to perform detailed lab tests on the SDV flanges until notified. In-situ hardness testing has provided reasonable assurance that material properties for these flanges are adequate for their application.

As requested by Supplement 1, we will retain WJM supplied flanges in our warehouse. These flanges have been segregated to ensure they are not inadvertently used.

Documents relating to our response to this bulletin are available for your inspection, and we have provided the information in Tables 1 through 4 to NUMARC.

IOWA ELECTRIC LIGHT AND POWER COMPANY

By B. W. McDaughy
William C. Rothert
Manager, Nuclear Division

Subscribed and sworn to before me on this 12th day of September, 1988.

Kathleen M. Turman
Notary Public in and for the State of Iowa

WCR/BGH/pjv+

cc: B. Hopkins
L. Liu
L. Root
R. McGaughy
J. R. Hall (NRC-NRR)
A. Bert Davis (Region III)
NRC Resident Office
Commitment Control 880177, 880225, 880226, 880310

TABLE 1

FLANGE DESCRIPTIONS

IDENTIFICATION NUMBER	FLANGE DIAMETER (INCHES)	PRESSURE RATING (PSI)	FLANGE TYPE	MATERIAL SPEC.	HEAT NUMBER	CMTR DATE	VENDOR	SUPPLY COMPANY
IE- 1	0.75	1500	* RF/SW	SA-105	A23	04/03/81	WJM	** CTI
IE- 2	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE- 3	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE- 4	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE- 5	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE- 6	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE- 7	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE- 8	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE- 9	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE-10	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE-11	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE-12	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE-13	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE-14	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE-15	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE-16	0.75	1500	RF/SW	SA-105	A23	04/03/81	WJM	CTI
IE-17	1.50	1500	SW	SA-105	8629 BWC	06/30/83	WJM	GUYON
IE-18	1.50	1500	SW	SA-105	8629 BWC	06/30/83	WJM	GUYON
IE-19	1.50	1500	SW	SA-105	8629 BWC	06/30/83	WJM	GUYON
IE-20	1.50	1500	SW	SA-105	8629 BWC	06/30/83	WJM	GUYON
IE-21	1.50	1500	SW	SA-105	8629 BWC	06/30/83	WJM	GUYON
IE-22	2.00	1500	SW	SA-105	22478 MP	02/11/83	WJM	GUYON
IE-23	2.00	1500	SW	SA-105	GDES	11/17/82	WJM	GUYON
IE-24	2.00	1500	SW	SA-105	22478 MP	02/11/83	WJM	GUYON
IE-25	2.00	1500	SW	SA-105	22478 MP	02/11/83	WJM	GUYON
IE-26	2.00	1500	SW	SA-105	GDES	11/17/82	WJM	GUYON
IE-27	2.00	1500	SW	SA-105	GDES	11/17/82	WJM	GUYON
IE-28	0.75	300	RF/SW	SA-105	M674701	06/30/83	WJM	CTI
IE-29	0.75	300	RF/SW	SA-105	M674701	06/30/83	WJM	CTI
IE-30	4.00	300	RF/WN	SA-105	T9411 GDIR	06/22/82	WJM	CTI
IE-31	4.00	300	RF/WN	SA-105	T9411 GDIR	06/22/82	WJM	CTI
IE-32	0.75	300	RF/SW	SA-105	76364 GDEZ	06/22/82	WJM	CTI
IE-33	4.00	300	RF/WN	SA-105	T9411 GDIR	06/22/82	WJM	CTI
IE-34	4.00	300	RF/WN	SA-105	T9411 GDIR	06/22/82	WJM	CTI

* RF = Raised Face
SW = Socket Weld
WN = Welded Neck

** CTI = Chicago Tube and Iron
GUYON = Guyon Alloys

Attachment to NG-88-3088

TABLE 2

PHYSICAL PROPERTIES OF TESTED FLANGES

ID NUMBER	TESTED TENSILE STRENGTH	CMTR TENSILE STRENGTH	TESTED YEILD STRENGTH	CMTR YEILD STRENGTH	TESTED PERCENT ELONGATION	CMTR PERCENT ELONGATION	TESTED % REDUCTION IN AREA	CMTR % REDUCTION IN AREA	TESTED HARDNESS (BHN)
IE- 1	71400	72500	37300	41500	29	28	57	50	137
IE- 2	73100	72500	38900	41500	31	28	60	50	139
IE- 3	74600	72500	40500	41500	31	28	62	50	143
IE- 4	74600	72500	39400	41500	28	28	62	50	143
IE- 5	73700	72500	39400	41500	37	28	62	50	140
IE- 6	72100	72500	40400	41500	33	28	66	50	144
IE- 7	74400	72500	39300	41500	30	28	62	50	143
IE- 8	73100	72500	40000	41500	34	28	60	50	141
IE- 9	72800	72500	37300	41500	29	28	60	50	144
IE-10	75500	72500	42200	41500	31	28	60	50	149
IE-13	75100	72500	40600	41500	30	28	61	50	147
IE-14	75000	72500	41100	41500	33	28	61	50	149
IE-15	74400	72500	39600	41500	28	28	56	50	144
IE-16	70400	72500	37800	41500	35	28	59	50	137
IE-17	81500	80228	46500	49689	27	26	56	54	164
IE-18	79400	80228	46500	49689	26	26	55	54	163
IE-19	78700	80228	44500	46689	25	26	55	54	163
IE-20	80000	80228	47400	46689	24	26	53	54	159
IE-21	81200	80228	46400	49689	25	26	53	54	165
IE-28	85900	77717	62300	51702	17	30	56	57	165
IE-29	65900	77717	32800	51702	33	30	61	57	121
IE-30	80300	86155	45000	49265	22	31	45	56	165
IE-31	76900	86155	43300	49265	25	31	55	56	143
IE-32	81400	82140	53100	42430	27	28	59	48	152
IE-33	86100	86155	48900	49265	25	31	55	56	169
IE-34	80700	86155	44800	49265	28	31	60	56	176

TABLE 3

CHEMICAL COMPOSITION OF TESTED FLANGES

ID NUMBER	TESTED CARBON CONTENT	CMTR CARBON CONTENT	TESTED MANGANESE CONTENT	CMTR MANGANESE CONTENT	TESTED SILICON CONTENT	CMTR SILICON CONTENT	TESTED PHOSPHATE CONTENT	CMTR PHOSPHATE CONTENT	TESTED SULFUR CONTENT	CMTR SULFUR CONTENT	TESTED CHROMIUM CONTENT	CMTR CHROMIUM CONTENT
IE- 1	0.240	0.280	0.690	0.770	0.160	0.240	0.012	0.010	0.023	0.021	0.070	0.000
IE- 2	0.240	0.280	0.760	0.770	0.180	0.240	0.011	0.010	0.019	0.021	0.070	0.000
IE- 3	0.240	0.280	0.730	0.770	0.170	0.240	0.011	0.010	0.020	0.021	0.070	0.000
IE- 4	0.230	0.280	0.720	0.770	0.170	0.240	0.010	0.010	0.021	0.021	0.070	0.000
IE- 5	0.240	0.280	0.730	0.770	0.170	0.240	0.011	0.010	0.021	0.021	0.070	0.000
IE- 6	0.170	0.280	0.880	0.770	0.210	0.240	0.012	0.010	0.028	0.021	0.100	0.000
IE- 7	0.240	0.280	0.740	0.770	0.180	0.240	0.011	0.010	0.021	0.021	0.070	0.000
IE- 8	0.230	0.280	0.730	0.770	0.170	0.240	0.011	0.010	0.020	0.021	0.070	0.000
IE- 9	0.240	0.280	0.750	0.770	0.170	0.240	0.010	0.010	0.021	0.021	0.070	0.000
IE-10	0.240	0.280	0.720	0.770	0.200	0.240	0.011	0.010	0.021	0.021	0.070	0.000
IE-13	0.240	0.280	0.790	0.770	0.200	0.240	0.011	0.010	0.019	0.021	0.070	0.000
IE-14	0.230	0.280	0.770	0.770	0.190	0.240	0.010	0.010	0.010	0.021	0.070	0.000
IE-15	0.230	0.280	0.770	0.770	0.190	0.240	0.011	0.010	0.020	0.021	0.070	0.000
IE-16	0.230	0.280	0.630	0.770	0.160	0.240	0.011	0.010	0.025	0.021	0.060	0.000
IE-17	0.270	0.300	0.910	0.900	0.210	0.210	0.017	0.020	0.018	0.018	0.000	0.000
IE-18	0.270	0.300	0.930	0.900	0.220	0.210	0.017	0.020	0.017	0.018	0.000	0.000
IE-19	0.280	0.300	0.920	0.900	0.220	0.210	0.017	0.020	0.017	0.018	0.000	0.000
IE-20	0.280	0.300	0.940	0.900	0.220	0.210	0.017	0.020	0.017	0.018	0.000	0.000
IE-21	0.280	0.300	0.910	0.900	0.220	0.210	0.017	0.020	0.018	0.018	0.000	0.000
IE-28	0.230	0.270	0.490	0.790	0.320	0.220	0.020	0.013	0.007	0.010	0.150	0.000
IE-29	0.210	0.270	0.390	0.790	0.250	0.220	0.014	0.013	0.019	0.010	0.000	0.000
IE-30	0.290	0.300	0.940	0.940	0.210	0.210	0.013	0.016	0.012	0.014	0.000	0.000
IE-31	0.280	0.300	0.930	0.940	0.240	0.210	0.012	0.016	0.023	0.014	0.000	0.000
IE-32	0.270	0.300	0.780	0.880	0.220	0.220	0.008	0.006	0.027	0.019	0.060	0.000
IE-33	0.300	0.300	0.970	0.940	0.210	0.210	0.015	0.016	0.013	0.014	0.000	0.000
IE-34	0.290	0.300	0.920	0.940	0.210	0.210	0.013	0.016	0.015	0.014	0.000	0.000

NOTE: Tested nickel content for all items is 0.000% except for item IE-6, which is 0.120%. Test molybdenum content for all items is 0.000%.

TABLE 4
RESULTS OF FINAL SDV FLANGE HARDNESS TESTS

IDENTIFICATION NUMBER	TESTED HARDNESS (BHN)
IE-22	135
IE-23	141
IE-24	132
IE-25	128
IE-26	139
IE-27	139

NOTE: Hardness testing for these flanges was performed in-situ with an EQUOTIP hardness tester.