

REGULATOR INFORMATION DISTRIBUTION SYSTEM (RIDS)

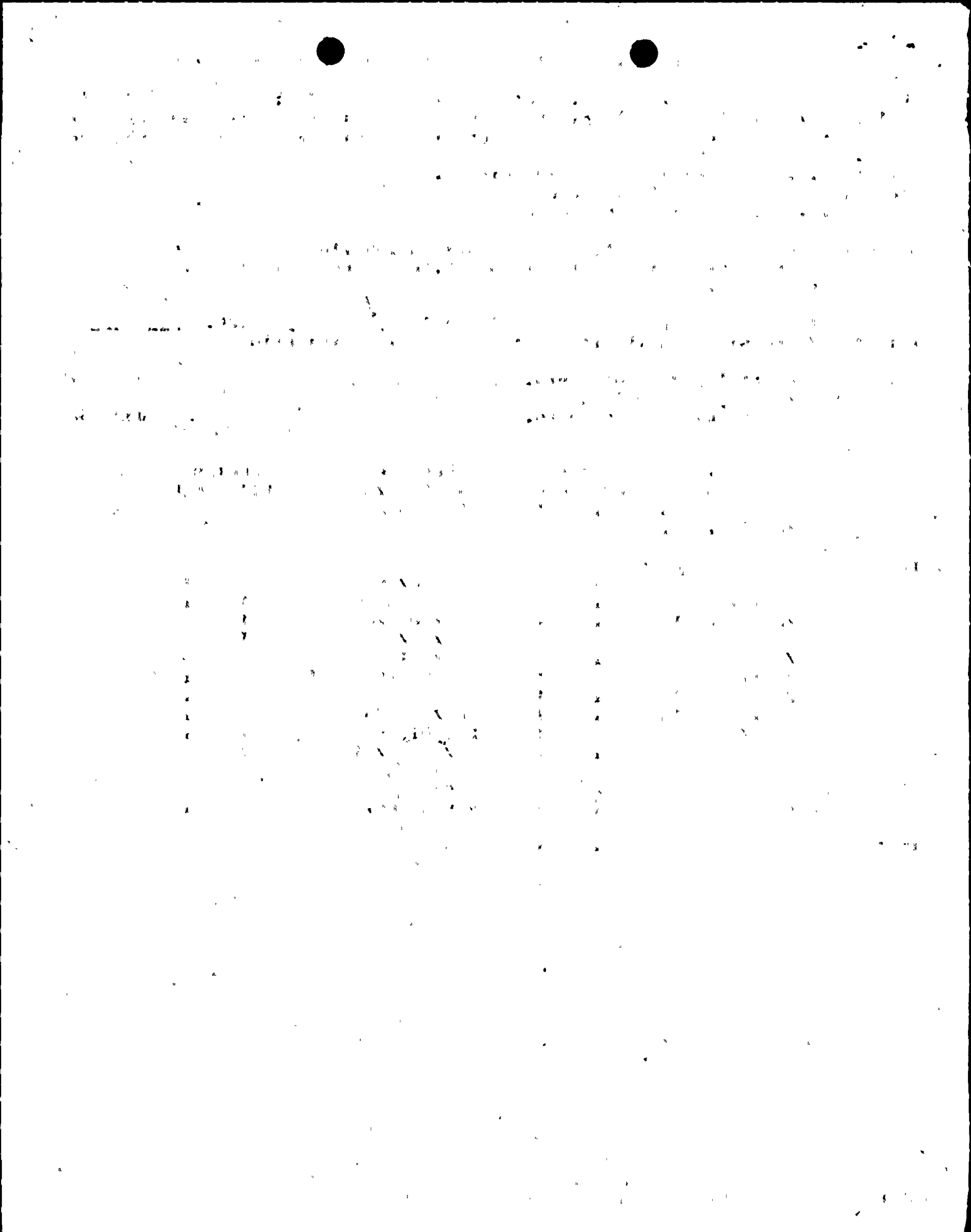
ACCESSION NBR: 8502270437 DOC. DATE: 85/02/22 NOTARIZED: NO DOCKET #
 FACIL: 50-275 Diablo Canyon Nuclear Power Plant, Unit 1, Pacific Gas ~~05000275~~
 50-323 Diablo Canyon Nuclear Power Plant, Unit 2, Pacific Gas 05000323
 AUTH. NAME AUTHOR AFFILIATION
 SHIFFER, J. D. Pacific Gas & Electric Co.
 RECIP. NAME RECIPIENT AFFILIATION
 KNIGHTON, G. W. Licensing Branch 3

SUBJECT: Forwards response to NRC Allegations 1452, 1453 & 1454 based on request during 850115-17 audit. Ack of receipt of matl requested.

DISTRIBUTION CODE: B021D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5
 TITLE: OR/Licensing Submittal: Combined General Distribution

NOTES: J Hanchett 1cy PDR Documents. 05000275
 OL: 09/22/81
 J Hanchett 1cy PDR Documents. 05000323

	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR ENCL
	NRR LB3 BC 05	1 1	NRR LB3 LA	1 0
	SCHIERLING, H 01	1 1		
INTERNAL:	ACRS 29	8 8	ADM/LFMB	1 0
	ELD/HDS2	1 0	NRR/DE/CEB 09	1 1
	NRR/DE/MTEB	1 1	NRR/DHFS DEPY12	1 1
	NRR/DHFS/HFEB16	1 1	NRR/DHFS/LQB	1 1
	NRR/DL DIR	1 0	NRR/DL/ORAB	1 0
	NRR/DL/SSPB	1 0	NRR/DSI/ADRS	1 0
	NRR/DSI/AEB 28	1 1	NRR/DSI/CPB 11	1 1
	NRR/DSI/CSB 10	1 1	NRR/DSI/ICSB 18	1 1
	NRR/DSI/METB 13	1 1	NRR/DSI/PSB 21	1 1
	NRR/DSI/RSB 25	1 1	REG FILE 04	1 1
	RGN5	1 1	RM/DDAMI/MIB	1 0
EXTERNAL:	LPDR 03	2 2	NRC PDR 02	1 1
	NSIC 06	1 1	PNL GRUEL, R	1 1
NOTES:		1 1		



PACIFIC GAS AND ELECTRIC COMPANY

PG&E + 77 BEALE STREET • SAN FRANCISCO, CALIFORNIA 94106 • (415) 781-4211 • TWX 910-372-6587

JAMES D. SHIFFER
VICE PRESIDENT
NUCLEAR POWER GENERATION

February 22, 1985

PGandE Letter No.: DCL-85-073

Mr. George W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Docket No. 50-275, OL-DPR-80
Docket No. 50-323
Diablo Canyon Units 1 and 2
Response to NRC Allegations #1452, #1453, and #1454

Dear Mr. Knighton:

During the NRC audit of January 15-17, 1985, at San Francisco, the NRC requested PGandE's response to the subject allegation. PGandE's response is enclosed. PGandE believes that the response resolves the allegation for both Units 1 and 2.

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Sincerely,



Enclosure

cc: R. T. Dodds
J. B. Martin
H. E. Schierling
Service List

B021
11

8502270437 850222
PDR ADOCK 05000275
Q PDR



1954

1954

1954

1954

1954

1954

1954

1954

1954

1954

1954

1954

1954

1954

1954

1954

1954

1954

1954

1954

ENCLOSURE

OVERVIEW OF ALLEGATIONS 1452, 1453, and 1454

Allegations 1452, 1453, and 1454 challenge PGandE's responses to prior Joint Intervenors' (JI) allegations 193 and 194.

The responses provided in PGandE's Response to JI Motion to Reopen on Construction Quality Assurance dated March 19, 1984, were and are true and correct. The original allegations and responses thereto are attached.

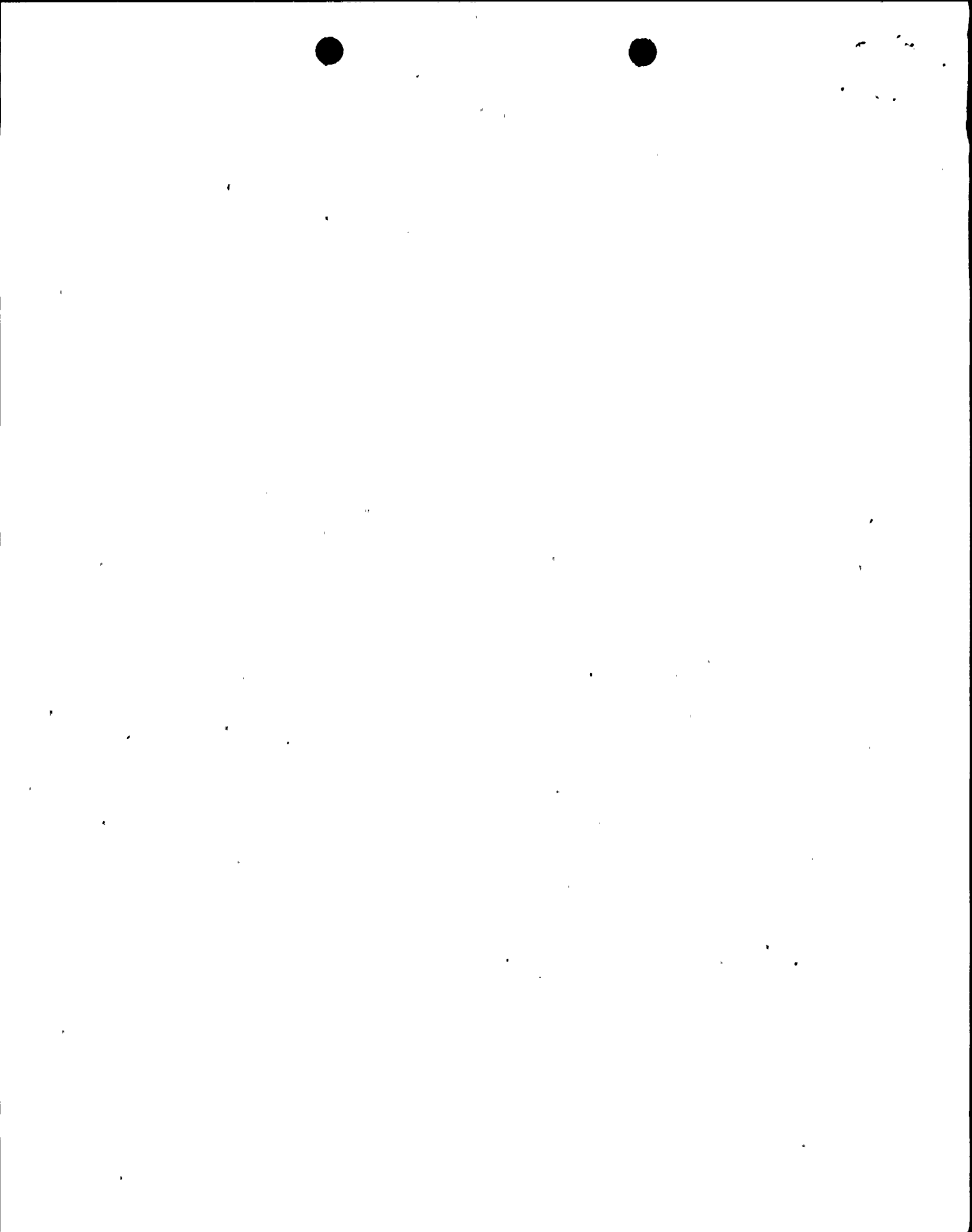
The stainless steel piping material at Diablo Canyon is nominally 18% chromium/8% nickel and is designated type 304. The permissible carbon content ranges from 0.04 minimum to 0.08 maximum. Types 304 and 316 stainless steel and their casting equivalents, CF8 and CF8M, have been the standard materials in PWR piping and have served without significant problems for many years. Type 304 material is appropriate for PWR plants because the service conditions are relatively benign and noncorrosive. The PWR service conditions are significantly different from the service conditions in BWR plants where high temperature oxygenated water in the reactor coolant system provides a relatively aggressive environment for type 304 material which has been sensitized.

Nonsensitized type 304 stainless steel material was specified and purchased for use at Diablo Canyon. Nonetheless, as discussed below, type 304 materials which may have become partially sensitized during the welding process are acceptable for use in PWR power plants.

The reference cited by the allegers, NUREG-0691, "Investigation and Evaluation of Cracking Incidents in Piping in Pressurized Water Reactors," did identify a relatively small number of isolated and unique cases of pipe leakage in the total population of PWR stainless steel piping systems used throughout the nuclear industry. These cases represent a very small percentage of the actual type 304 stainless steel piping in use. Causes of the cracks and leaks other than corrosion related to sensitization are also addressed in the NUREG.

Contrary to the original allegation that at San Onofre 1, "...all of the high carbon stainless steel had to be replaced after only a few years of service because of extensive corrosion," NUREG-0691 confirms the initial PGandE response to the JI allegation that there were only a few cases of stainless steel pipe leakage at San Onofre 1 (NUREG-0691, at 2-7 and 2-8). Neither Diablo Canyon nor San Onofre 1 uses or has used high carbon, type 304H, stainless steel piping. Of the type 304 stainless steel pipe used at San Onofre 1, only a very small percentage was required to be replaced. Thousands of feet of type 304 stainless steel pipe in the plant continue to perform satisfactorily without problems.

The intergranular stress corrosion cracking (IGSCC) and leaks at San Onofre 1, as described in NUREG-0691, were attributed to special localized environmental conditions external to the piping. As pointed out in the NUREG, external chloride contamination was the cause of cracking in the containment spray



system (CSS), the seal water return line and discharge line of the charging pump, and the refueling water suction piping (NUREG-0691, pages 2-7, 2-8, and 2-11). The piping systems at San Onofre 1 which experienced cracking from external chlorides, i.e., resulting primarily from salt water spray, are located out of doors. At Diablo Canyon, all safety-related stainless steel piping systems are housed indoors, thus offering less potential for exposure to a high chloride environment.

The Pipe Crack Study Group established by the NRC has concluded that where stress corrosion cracking (SCC) in PWR secondary systems has been observed, there was not a significant safety problem (NUREG-0691 at 4,11). Thus, the concern for sensitization and IGSCC is minimal, and these allegations are without merit.

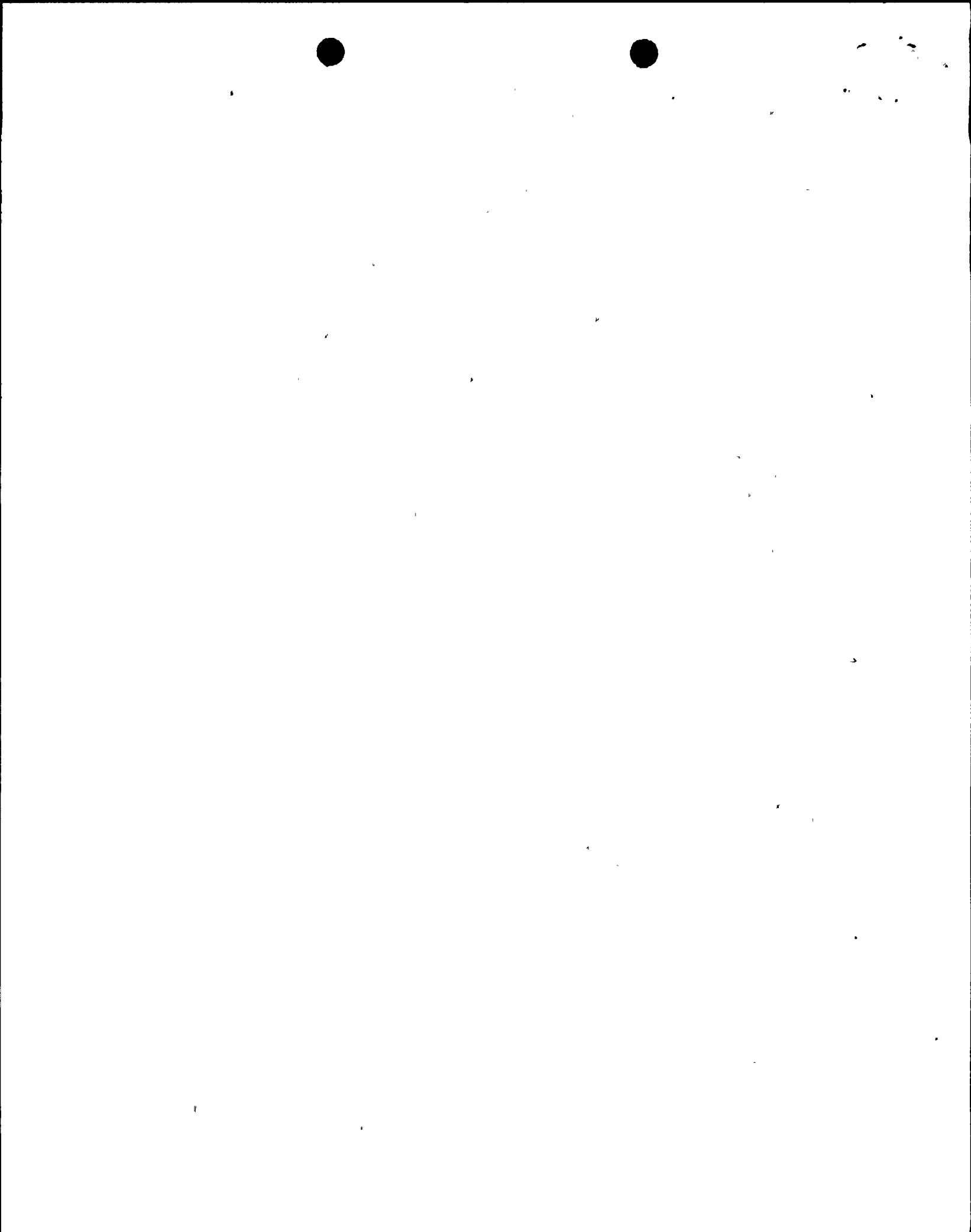
NRC Allegation #1452

It is alleged that:

PGandE in answer #3 offers another defense -- that the welding has been appropriately controlled for heat input and interpass temperatures. That statement is false. The welding procedures were sufficiently vague and broad that heat input could exceed the limits necessary to control carbide precipitation. See conclusions of T.G. Gooch of The Welding Institute in Metal Progress (March 1984), at page 75. It is enclosed as Exhibit 1. In some cases the procedures are up to three times more than permissible under this analysis. As Dr. Donald Hetzel concluded in the same article "excessive heat inputs during welding are the primary cause of IGSCC, yet under the mistaken belief that productivity will suffer or sometimes because of the less noble incentive of circumventing the quality control department, some companies ignore proper heat input control or make their allowable limits so broad as to be ineffective for protection of the material." (emphasis added). That is exactly what happened at Diablo Canyon, with IGSCC cracking as a possible result.

PGandE also was wrong to say that heat input was controlled, because welding inspectors were not trained to monitor heat input. Written engineering specifications required monitoring this condition by checking the interpass temperature.

Welding procedures did not include provision for monitoring heat input limits. This is because heat input is fundamentally limited to the extent necessary for the Diablo Canyon service conditions by electrode diameter and welding positions. Because there was no need to directly monitor heat input limits, inspectors were not trained to do so.



Interpass temperature monitoring, however, as acknowledged by the allegor, was required by specification. This control was not employed to directly monitor heat input, as is implied; rather, it was used to minimize sensitization. Due to the relatively simple nature of the required check, inspectors were able to easily carry out interpass temperature monitoring which is included on the work process traveler for welds in process.

Contrary to the implication of the allegation, heat control was not ignored and the welding at Diablo Canyon was conducted under an established QA/QC program which monitored interpass temperature.

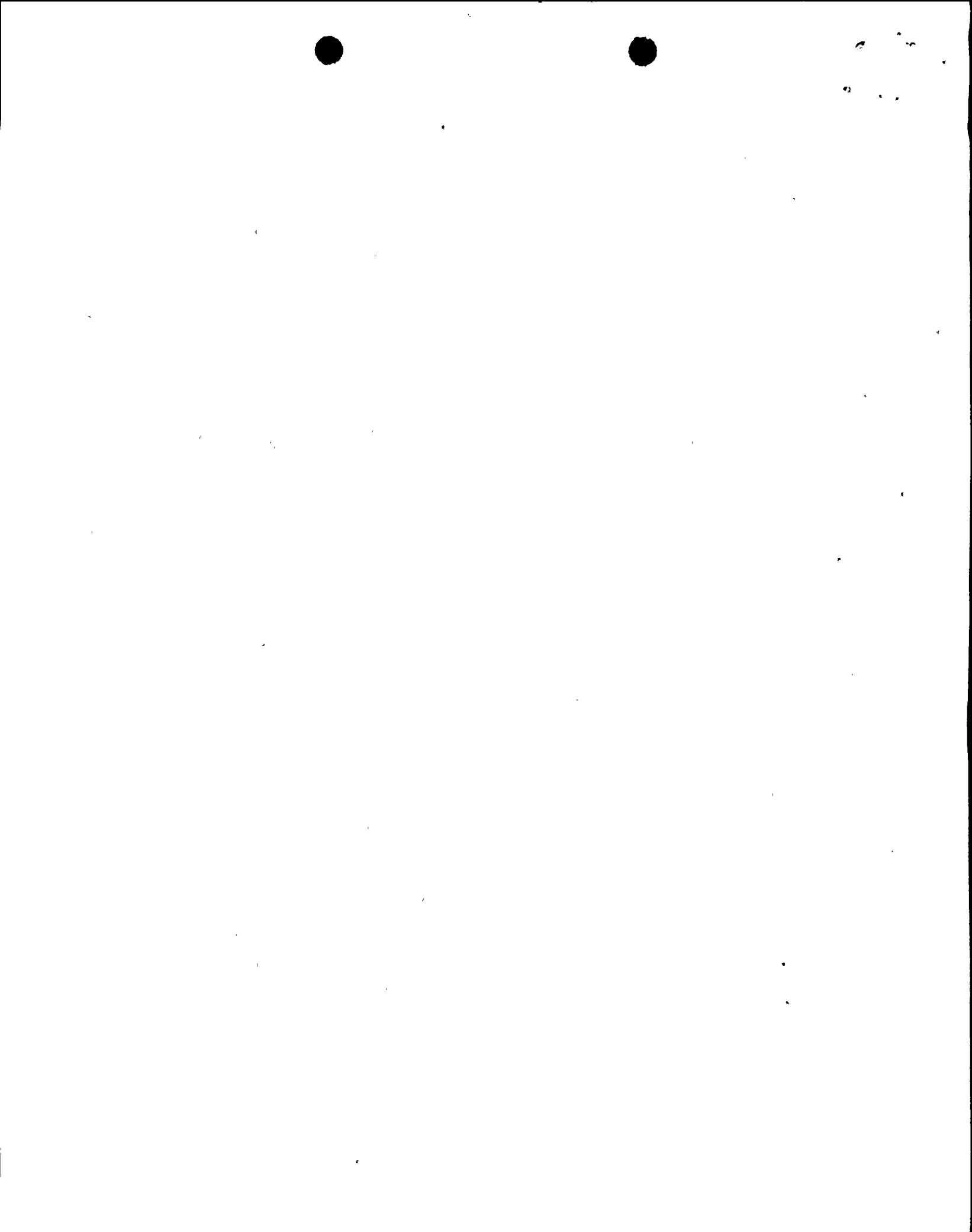
As part of the ASME Section XI program, PGandE adopted a welding procedure, for postoperational use only, which requires additional control of heat input. In addition, the current site services contractor who is performing maintenance work on Unit 1 and construction completion on Unit 2 has also adopted a similar provision. Both provisions were adopted as an added conservatism and not as a matter of technical or regulatory requirement.

NRC Allegation #1453

It is alleged that:

In #3 PGandE also said that there were only "a few cases" of stainless steel pipe leakage at San Onofre, which also used lines with .04% or greater carbon. That is a false statement. NUREG-0691 reported cracks (which also have leaks) in the containment spray system, the refueling water pump, and the seal water return line and discharge line of the charging pumps -- with replacement of piping and twice in the refueling water suction piping, as well as other cases documented in the NUREG at other plants.

The statements in PGandE's original response were, and are, true and correct. The NUREG found only a few instances of leakage at San Onofre 1 (all of which the allegor has identified) and less than 1% of the type 304 piping was required to be replaced. Type 304 austenitic stainless steel is a tough ductile material which, in piping service, is characterized by leaking before breaking. This material does not crack in the sense of running brittle



fracture. Even where stress corrosion cracking (SCC) occurs, the nature of the cracks may allow the system to maintain function (NUREG-0691 at 4). Contrary to the inference of the allegation, all cracks are not leaks.

NRC Allegation #1454

It is alleged that:

In response #4, PGandE said that an inspection program would have caught any cracking. That again maybe (sic) a false statement with respect to the allegation, because it is apparently irrelevant to the allegation. If PGandE is referring to in-process inspections, it covers the RCS system. The allegation refers to the secondary lines.

The original allegations did not specifically address the RCS or secondary systems, and the previous responses were not limited to the RCS system. The original allegations and responses are attached hereto. PGandE clearly stated in Paragraph 4 of Response to JI 193 that the ultrasonic and dye penetrant testing program was applied in accordance with ASME Section XI. The ASME Section XI inspection program at Diablo Canyon includes both preservice and in-service inspections of Class 1, Class 2, and Class 3 piping systems. Contrary to the allegation, the inspection program extends far beyond the RCS system and includes required secondary systems. By way of note, all the systems which are reported by NUREG-0691 to have leaked or cracked at San Onofre 1 are subject to the Diablo Canyon ASME Section XI Class 1 or Class 2 program.

As pointed out previously, the NRC Pipe Crack Study Group has concluded that, "...for those lines in PWR secondary systems where SCC has been observed, such incidents do not represent a significant safety problem" (NUREG-0691 at 11). The allegation is without merit.



11-11-11
11-11-11