UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
DUKE POWER COMPANY, et al.	)	Docket Nos. 50-413
	)	50-414
(Catawba Nuclear Station, Units 1 and 2)	)	

TESTIMONY OF THOMAS H. MULLINAX
CONCERNING MR. LANGLEY'S ALLEGATIONS PERTAINING
TO ALLEGED HARRASSMENT OF WELDING INSPECTORS

Q. STATE YOUR NAME AND BUSINESS ADDRESS.

A. Thomas H. Mullinax, Duke Power Company, Catawba Nuclear Station, P.O. Box 223, Clover, South Carolina, 29710.

Q. STATE YOUR PRESENT JOB POSITION WITH DUKE POWER COMPANY AND DESCRIBE THE NATURE OF YOUR JOB.

A. I am a Steelworker Foreman. I supervise a crew of 14 - 20 men involved in erecting structural steel, fabrication and installing miscellaneous steel, and rigging and setting equipment. This work includes erecting and fitting containment shell plate.

Q. WHAT OTHER JOBS HAVE YOU HELD WITH DUKE POWER?

A. I started working for Duke Power in 1956 as a steelworker. I left the Company in 1968 for four years and returned in 1972 as a steelworker. I became a foreman in 1973.

Q. ARE YOU FAMILIAR WITH THE ALLEGATIONS OF MR. LANGLEY THAT HE AND ANOTHER INSPECTOR WERE INTIMIDATED BY THE CRAFT FOREMAN WORKING ON THE PERSONNEL AIR LOCKS?

A. I do not recall any incident that a Mr. Langley was involved in. I was involved in an incident with Lindsay Harris, another welding inspector.

Q. DESCRIBE THE INCIDENT WITH LINDSAY HARRIS.

A. The men under my supervision engaged in fitting-up the personnel air lock to the containment shell plate came to me and informed me that an NCI was going to be written on the work they were performing. I asked why, and to the best of my knowledge the men informed me that the inspector (Lindsay Harris) said that they had welded on the plate without preheating it. My crew claimed that they had preheated it; had told the inspector they had preheated; that the inspector had called them a liar; they were not going to take that and would knock his teeth down his throat if he did it again, or words to that effect.

I talked with Lindsay Harris, and to the best of my recollection, he told me that the men had welded without preheating and that the men had called him a liar first. Lindsay and I argued about the incident. I cannot recall what was said during the argument, but I believe it centered on who was right and who was wrong about whether the preheat had been made. The inspector and I agreed to go see each of our supervisors. We were walking to the offices when I conveyed to Lindsay the feelings of the men about being called a liar and told him, as best as I can recall, that if he continued to call the men liars that he would get his teeth knocked in. We continued to our respective supervisors' offices,

and I informed my supervisor, Mr. W. K. Henry, of the incident and related to him what had taken place. Mr. Henry and I went to the job superintendent's office and and to the best of my recollection, informed Mr. Ralph Morrison of the events up to that point.

As best as I can recall, we were told to come back the first thing next morning due to the lateness of the hour. As best as I can recall, Mr. Henry and I and one or both of the crew members involved went to the superintendent's office the next morning to discuss the incident. We related what had happened to the people at the meeting, but I don't recall who was there. As best as I can recall the incident was discussed but I can't recall exactly what was said.

I believe it was the next day, I can't recall exactly, that I was called to Mr. Cecil Wall's office. He was the Job Superintendent. I was asked by him what had happened and I told him. I can't recall whether Mr. Henry was with me at that meeting or not, but Mr. S. O. Shelby, the Steelworker craft superintendent, was on vacation. Mr. Wall had Mr. Shelby called to come in from vacation. Mr. Wall, Mr. Shelby , and I met, but I can't recall who else was there at the meeting. I don't recall exactly what Mr. Wall and Mr. Shelby said to me, but the message I got from the meeting was that is was a very serious matter to attempt to intimidate or to threaten an inspector and that such things would not be tolerated.

I told Mr. Wall that I was not threatening or trying to intimidate the inspector but was advising him of the way some of my men felt about being called a liar. I informed my men that any questions arising during the course of an inspection were to be brought to me immediately and that there should be no arguing by the craftsmen with the inspectors. I don't recall exactly when, but later I informed the crew that arguments with inspectors were to be avoided; that no threats or intimidation would be tolerated, that all questions should be brought to me. I do not remember whether I talked to the two craftsmen separately or with the whole crew, but this message was give to them.

Q. WHAT INSTRUCTIONS HAVE YOU BEEN GIVEN CONCERNING THE CRAFT'S RELATIONSHIP WITH INSPECTORS?

A. I have been instructed on numerous occasions that there was to be no arguing with the inspectors. That any threats or intimidations would be considered very serious and dealt with accordingly. That any questions arising that could not be solved without arguing were to be taken to higher management to be resolved.

I have been instructed to maintain an attitude of cooperation with the inspectors as well as the other Crafts. I have been instructed to work with and assist inspectors in performing their duties and to perform rework if necessary to bring the work into compliance with the inspection requirements.

Q. HAVE THESE SAME INSTRUCTIONS BEEN GIVEN TO YOUR CREW?

A. These same instructions have been given to the crew members.

U. S. DEPT. OF LABOR
WAGE-HOUR DIVISION
FEDERAL BUILDING ROOM 1072
1835 ASSEMBLY STREET
COLUMBIA, S.C. 29201

Phone: 765-5981

[redacted]

December 20, 1983

Mr. Howard S. Munn, Jr.
c/o Ms. Billie Garde
Government Accountability Project
Institute for Policy Studies
1901 Que Street, N. W.
Washington, DC 20009

Subject: Howard S. Munn, Jr. vs. Duke Power Company

Dear Mr. Munn:

This letter is to notify you of the results of our compliance actions in the above case. A previous letter from this office advised you that your complaint was received on November 22, 1983, and enclosed a copy of Regulations, 29 CFR Part 24 and a copy of the pertinent section of the Energy Reorganization Act.

Our initial efforts to conciliate the matter revealed that the parties would not at that time reach a mutually agreeable settlement. An investigation was then conducted. Our investigation did not verify that discrimination was a factor in the actions comprising your complaint. Conversely, it is our conclusion that your allegations are unprovable for the following reasons:

The investigation disclosed that you were terminated by Duke Power Company for excessive absenteeism. The basic company policy specifies a limit of 17 occurrences over a period of 12 consecutive months. The records show you had 18 occurrences during the period from 11/10/82 to 10/14/83. In addition, our investigation did not substantiate that you were in any way, harassed or intimidated by your supervisor or the company.

This letter will notify you that if you wish to appeal the above findings you have a right to a formal hearing on the record. To exercise this right you must, within five (5) calendar days of receipt of this letter, file your request for a hearing by telegram to:

The Chief Administrative Law Judge
U. S. Department of Labor
Suite 700, Vanguard Building
1111 - 20th Street, N. W.
Washington, DC 20036

Unless a telegram request is received by the Chief Administrative Law Judge within the five day period, this notice of determination will become the Order of the Secretary of Labor dismissing your complaint. In this letter I am advising Duke Power Company of their rights in this case and the right to a hearing. A copy of your complaint has been sent to the Chief Administrative Law Judge with your complaint. If you decide to request a hearing it will be necessary to send copies of the telegram to Duke Power Company and to me at U. S. Department of Labor, Wage Hour Division, 1835 Assembly Street, Federal Building, Room 1072, Columbia, SC 29201; AC 803/765-5981. After I receive the copy of your request, appropriate preparations for the hearing can be made. If you have any questions do not hesitate to call me.

It should be made clear to all parties that the role of the Department of Labor is not to represent the parties in any hearing. The Department would be neutral in such a hearing which is simply part of the fact-development process, and only allows the parties an opportunity to present evidence for the record. If there is a hearing, an Order of the Secretary shall be based upon the record made at said hearing, and shall either provide appropriate relief or deny the complaint.

Jerry L. Stuckey
Area Director

cc:
Mr. Warren Owen
Vice President for Construction & Engineering
Duke Power Company
P.O. Box 33189
Charlotte, NC 28242

Nuclear Regulatory Commission
101 Marietta Street, Suite 3100
Atlanta, GA 30303

The Chief Administrative Law Judge
U. S. Department of Labor
Suite 700, Vanguard Building
1111 - 20th Street, N. W.
Washington, DC 20036

PAGE OF

DATE

DATE

U.S. Department of Labor
U. S. DEPT. OF LABOR
WAGE-HOUR DIVISION
FEDERAL BUILDING ROOM 1072
1835 ASSEMBLY STREET
COLUMBIA, S.C. 29201

Official Business
Penalty for Private Use, $300

NAME
1st Natio
2n
Retu

Postage and Fees Paid
U.S. Department of Labor
Lab 441

U.S. MAIL

Nuclear Regulatory Commission
101 Marietta Street, Suite 3100
Atlanta, GA 30303

CERTIFIED
P30 9938693
MAIL

20

B203

SUBJECT

PREPARED BY

ACTION REQUIRED

REVIEWED BY

Includes: _____

REGION II ROUTING SHEET RII-83-A-0091

Number Copies Received 1

ROUTING	ADDRESSEE	INITIALS	DATE	COMMENTS
1	REGIONAL ADMINISTRATOR			Note
	Secy. to Regional Administrator			
	DEPUTY REGIONAL ADMINISTRATOR			
	Secy. to Deputy Reg. Administrator			
	ASST. TO THE REGIONAL ADMINISTRATOR			
2	REGIONAL COUNSEL	[illegible]		
3	DIRECTOR, PRP			
	DIRECTOR, EOP			
	DIRECTOR, EPHSP			
	DIRECTOR, RMA			
	DIRECTOR, PROGRAM SUPPORT STAFF			
	DIRECTOR, PUBLIC AFFAIRS STAFF			
	DIRECTOR, STATE & GOVT. AFFAIRS STAFF			
	FIELD DIRECTOR, OI			
	COLLATERAL ASSIGNMENTS			
	EEO COUNSELOR			
	EMERGENCY PLANNING COORDINATOR			
	EMPLOYEE DEVELOPMENT SPECIALIST			
	FEDERAL WOMEN'S PROG. COORDINATOR			
	HEALTH & SAFETY OFFICER			
	NTEU VICE-PRESIDENT			
	SECURITY OFFICER			

FINAL DISPOSITION: _____

Form RII-A-18
(Revised 12/13/82)

DEC 01 RECD From R.D. MARTIN:

U. S. DEPT. OF LABOR
WAGE-HOUR DIVISION
FEDERAL BUILDING ROOM 1072
1835 ASSEMBLY STREET
COLUMBIA, S.C. 29201
Phone: 765-5981

83 NOV 23 A10:40

November 22, 1983

Mr. Howard S. Nunn, Jr.
c/o Ms. Billie Garde
Government Accountability Project
Institute for Policy Studies
1901 Que Street, N. W.
Washington, DC 20009

Dear Mr. Nunn:

This will acknowledge receipt of your complaint against Duke Power Co. alleging violations of the Atomic Energy Act (Energy Reorganization Act) 42 U.S.C. 5851. Your complaint was received in this office on November 22, 1983.

The Act requires the Secretary of Labor to notify the person named in the complaint of its filing and to conduct an investigation into the alleged violations. Consequently, we are providing Duke Power Co. with a copy of your complaint and advising of the Wage and Hour Division's responsibilities under this law. We have enclosed a copy of the pertinent section of the Act, and a copy of Regulations, 29 CFR Part 24 for your information.

This case has been assigned to Compliance Officer Carol Merchant whose first action will be to try and achieve a mutually agreeable settlement through conciliation. If this is not attainable an investigation will be conducted as soon as possible. If you have further evidence, please give it to our representative who will contact you on this matter. If you have any questions do not hesitate to call me or our representative at (803) 765-5981.

Jerry L. Stuckey
Area Director

Enclosure

cc:
Nuclear Regulatory Commission
101 Marietta Street, Suite 3100
Atlanta, GA 30303

Official Copy

U. S. DEPT. OF LABOR
WAGE-HOUR DIVISION
FEDERAL BUILDING ROOM 1072
1835 ASSEMBLY STREET
COLUMBIA, S.C. 29201

Phone: 765-5981

November 22, 1983

Mr. Warren Owen
Vice President for Construction & Engineering
Duke Power Company
P.O. Box 33189
Charlotte, NC 28242

Dear Mr. Owen:

This will notify you that the Wage and Hour Division of the U. S. Department of Labor has received a complaint from Mr. Howard S. Nunn, Jr. alleging discriminatory employment practices in violation of the Atomic Energy Act (Energy Reorganization Act) 42 U.S.C. 5851. This charge was received by our office on November 22, 1983. We have enclosed a copy of the complaint, a copy of Regulations, 29 CFR Part 24, and a copy of the pertinent section of the Act.

The Act requires the Secretary of Labor to conduct an investigation into the violations alleged. This case has been assigned to Compliance Officer Carol Merchant whose first action will be to try and achieve a mutually agreeable settlement through conciliation. If this is not attainable, the law requires that an investigation be conducted as soon as possible. You are encouraged, and will be given every opportunity, to present any relevant information or evidence to our representative.

Thank you for your cooperation in this matter.

Jerry L. Stuckey
Area Director

Enclosures

cc:
Nuclear Regulatory Commission
101 Marietta Street, Suite 3100
Atlanta, GA 30303

November 18, 1983

The Honorable Raymond Donovan
Secretary of Labor
U.S. Department of Labor
Washington, D.C.

Attention: Wage and Hour Division

Dear Secretary Donovan:

Pursuant to the Atomic Energy Act as amended, 42 U.S.C. § 5851, and 29 C.F.R. Part 24, I hereby file this complaint with the Secretary of Labor. I allege that on October 20, 1983 I was discriminated against by my termination, and prior to that by the restrictions, conditions and terms of my employment as a welder for Duke Power Company (Duke) on the Catawba Nuclear Power Plant under construction in Clover, South Carolina.

On October 20, 1983 I was informed that I had been terminated. Five days previous, on October 14, 1983 I was informed that I was being suspended pending an "in house" investigation of my allegations of harassment and intimidation by my supervisors and by the Duke Power Company Employee Relations Department, and a review of safety and hardware concerns I had been raising for some time. Specifically I allege that my termination on October 20, 1983 was a direct result of my exposing my concerns to the Nuclear Regulatory Commission on October 14, 1983, and that my suspension initiated on the same day resulted from my rejection of the Employee Relations Department's institutionalized violation of my rights. I was informed that I was being terminated for violating Duke's attendance policy.

These acts of discrimination were in retaliation for my disclosures to my foremen, general foremen, and on one occaision to the site ANI inspector about laminations in the vendor conponents used in the reactor containment vessel, and the lack of adeguate correction procedures to correct the problem; I also dissented against:

1. the use of "bad" TIG wire and welding rods which the welders were required to use to weld and do correction work,

2. the authority of construction foremen to "override" workers who were attempting to follow NRC approved construction procedures, and

3. other incidents and examples I have disclosed to the Nuclear Regulatory Commission (NRC).

Pursuant to the provisions cited on page one of this letter I request both compensatory and punitive damages. Specifically, I seek reinstatement to my former position as a top paid welder for Duke Power Company with commensurate duties and responsibilities; the removal from my work record of all negative comments resulting from my dissent; a removal from my personnel record of all absences incurred as a result of the harassment and intimidation, and back pay and benefits from the time of my dismissal and for any time missed as a result of this incident.

Finally, I am concerned that I may suffer additional retaliation, through the doctoring of my personnel records which I have requested but not received from Duke, as a result from filing this complaint to the Department of Labor. I reserve the right to add items to this complaint as I become aware of them.

Out of concern for my safety and the safety of my family I have not included my address and phone number and request that I be contacted through Ms. Billie Garde of the Government Accountability Project of the Institute for Policy Studies, at 1901 Que Street, N.W., Washington,D.C. 20009, phone number (202) 234-9382.

I look forward to your immediate response.

Sincerely,

Howard Samuel Nunn, Jr.

HOWARD S. NUNN, JR.

cc: GAP/IPS
NRC, RII

B. Ruff

Welder: 'Slack Up' Ordered

In Weld Inspections At Catawba Plant

By JACK HORAN
Staff Writer

ROCK HILL — A Duke Power Co. welding inspector testified Wednesday his bosses told him he was overinspecting and ordered him to "slack up" reinspection of welds at the Catawba nuclear power plant.

Boyce Cauthen, the fifth of a possible 31 inspectors subpoenaed to testify in the federal licensing hearings, told a Nuclear Regulatory Commission (NRC) panel about his job to conduct final inspections of piping systems in the uncompleted nuclear plant.

Panel member Paul Purdom asked Cauthen how he understood the meaning of "slack up" instructions, which Cauthen said were relayed to him by supervisor G.E. "Beau" Ross.

"They said it meant to look for construction damage (to the pipes)," Cauthen replied, and not to reinspect welds that had already been checked by other inspectors.

Then, Duke lawyer Mike McGarry, trying to show such instructions had no significance on safety, asked Cauthen whether he approved any faulty welding work as a consequence.

Cauthen, a former welder, answered that he didn't. He also clarified a statement in written testimony submitted earlier that none of the welds he checked were defective. His original statement said, "I don't know if the plant is constructed safely."

"Do you question the safety of Catawba?" McGarry asked Cauthen, seated in the jury box at the federal courtroom in Rock Hill.

Cauthen paused, then said: "I can wonder and speculate, but what I welded and checked, I'm satisfied."

Under questioning from Bob Guild, attorney for the anti-nuclear power Palmetto Alliance, Cauthen recounted instances of what he termed harassment from fellow inspectors for finding defects in welds they had inspected. "I had reason to believe they didn't do a good job," Cauthen said.

The Palmetto Alliance is challenging the licensing of Catawba, 19 miles southwest of downtown Charlotte in York County, S.C., primarily on the grounds the plant may contain faulty workmanship and may not be safe to operate.

Two years ago, Cauthen and other welding inspectors complained to top Duke management that middle managers often overrode the inspectors' citations, pressured them to approve faulty work and didn't support them in disputes with construction crews.

Duke concedes its investigations found procedural violations and poor communications but no faulty welds.

After Cauthen's testimony, the three-member panel met in a second secret session with an unidentified present or former Catawba worker, who took up the panel's invitation to convey safety-related concerns in private.

20 THE CHARLOTTE OBSERVE Wednesday, November 9, 1983

Bruno

Catawba Inspector Says Welds Safe

By JACK HORAN
Staff Writer

ROCK HILL — A six-year veteran welding inspector at the Catawba nuclear power plant testified Tuesday it was vigilance by the welding inspectors that ensured against faulty welds in the face of a deteriorating quality-control program in 1981.

"There was a possibility ... there could have been problems," inspector John Rockholt told a Nuclear Regulatory Commission (NRC) licensing panel. "But we stood our ground ... and we did do our job. Due to that, I believe it (Catawba) will be safe."

Rockholt, the fourth inspector to testify as the licensing hearings began their sixth week, said he carried out his duties despite low morale and spoke out despite the threat of retaliation from his Duke Power Co. bosses.

But under questioning from an attorney for the anti-nuclear power Palmetto Alliance, Rockholt conceded he could only say with authority that the welds he checked were safe and couldn't speak about whether flaws exist in other parts of the uncompleted plant.

The Palmetto Alliance is attempting, in part through the testimony of as many as 31 Duke inspectors, to show there was a breakdown in the quality-control program at Catawba. The group says the breakdown — Duke officials say it didn't occur — suggests faulty workmanship in the $3.9 billion plant 19 miles southwest of downtown Charlotte.

Rockholt said unless the welding inspectors had failed to bring procedural violations to the attention of top Duke management, "the situation possibly could have deteriorated to the point where safety could have been jeopardized."

Panel Chairman James Kelley asked Rockholt how frequently Duke supervisors verbally overrode inspectors' deficiency citations. "Should I worry about that? Is that a big deal or a small deal?"

Rockholt said the total of 30-35 deficiency citations that were voided, a fraction of those approved, didn't bear on plant safety.

While Palmetto contends the voiding practice points to a breakdown in the inspection program, Duke officials have said it was proper for supervisors to overrule the inspectors.

Then panel member Paul Purdom asked Rockholt whether workers knew in advance when NRC inspectors would visit the plant, a charge leveled last month by a former Catawba worker.

Yes, Rockholt replied. "You'd just hear the NRC was going to be here in force," he said.

In an interview, NRC official Jack Bryant said some inspections are prearranged with the utility that owns a nuclear plant. "(But) 95% are unannounced. This is a strict thing," he said.

The NRC panel planned to meet in secret Tuesday night with three unidentified workers or former workers who wanted to relay safety-related concerns about the plant in confidence. Kelley would only say the panel would meet with them this week.

12-2-83

Dear Bamm,

After I phoned my "going public" plans to you last night — seems Tom Devine had not been fully informed on my case, and I was therefore urged to hold up a little while longer.

Sorry to take up your time or mislead you, but Billie's advice kept to override personal judgement at this point. She's been dead on course for me all the way — But that's her job (doesn't pay too much!), and I deeply respect her advice.

So ... please treat this tape as "in confidence" until +?. You'll be the first to know!

Very respectfully yours,
H. Sam Kuan

I'll be phoning you around 8:A.M., or this letter will be merely verification

DO NOT DISCLOSE
Contains Identity of
Confidential Source

#5 12

AFFIDAVIT

My name is Howard Samuel Nunn, Jr. I am making this statement freely and without threat or promise of material reward to Billie Garde and Emily Ansell, who have identified themselves to me, respectively, as Director of the Citizens Clinic and investigator with the Government Accountability Project, and to Phil ~~Ruttlidge~~ Rutledge #3 N' 11/14/83 who has identified himself to me as assisting the Government Accountability Project ~~with this interview.~~ #3 N' 11/14/83

I am making this statement because I am concerned about the quality of the Catawba Nuclear Power Station being built in Clover, South Carolina. I believe that as a result of my being a conscientious employee at the plant Duke Power Company (DPC or Duke) waged a campaign to get rid of me. This campaign negatively affected my economic future, my health and wellbeing, and my family relationships.

In 1961 I graduated from Hanes High School in Winston-Salem, North Carolina. After that, I attended college for one year. In addition to this, in the spring of 1978 I received certification as a welder from the Froehling and Robertson Testing Laboratory. This certified me to do #5 N any carbon steel welding, plate or pipe anywhere in the United States ~~bridge work, pipe work, carbon steel work, and plate welding in all positions.~~ that recognized this certification. #5 N 11/14/83

I worked as a welder for Duke Power Company at the Catawba plant from November 1980 until October 20, 1983, when I was fired for, I believe, being a conscientious employee who raised concerns over the quality of the plant. Prior to my job at Catawba I worked for Duke from September 1978 to November 1980, as a welder at their

McGuire Nuclear Plant on Lake Norman in North Carolina. Before that, from 1976 ~~to~~ September 1978, I worked as a welder, doing bridge and highway work, for Crowder Construction in Charlotte, N.C. At Crowder I worked myself up to a position of responsibility, where I was frequently called upon to be a troubleshooter. Although I had to do a lot of travelling for the company, I enjoyed my work and the trust they had in me.

From 1974-1976 I worked for the Blythe Bros., construction contractors, Charlotte, North Carolina, as a field service welder doing bridge work and highway work. Before that, from summer 1973 to about January ~~1977,~~ 1974 I was a welder with Dresser Engineering in Charlotte, North Carolina. I also worked as a barge welder, for about one year - from 1972 to 1973, for Paducah Marine Ways in Paducah, Kentucky.

Before becoming a welder I played saxaphone in a band that travelled throughout the United States. This was during the period of 1965 to March 1972. In early 1973 my father had a stroke and I decided to leave my band and return home. For a short time between welding jobs, I went back to playing with the band, approximately between March 1973 and August 1973.

I was hired by Duke in September 1978. In order for me to be a welder at McGuire I had to pass a certification test, the "~~154~~ 300" procedure", which I passed the first time I took it. I was thereafter a low paid welder, working in the Auxiliary Building at the 750 elevation. My job duties included helping TIG welders by finishing up their welds with stick rod. On my cwn time, I

practiced doing TIG work. At the end of my first 90 days at McGuire my foreman, C. E. Allison, told me that I was an exceptional welder. After seven months I became a middle-pay welder, and another seven months later I became a top-pay welder.

While at Duke I became certified in numerous welding procedures, all of which added to my qualifications as a welder.

After a year of welding on hangers and some piping in the Auxiliary Building at McGuire I was very satisfied with my job. My foreman, C. E. Allison, was also well satisfied with me. In fact, Mr. Allison began to count on three of us in our crew to work overtime: Dick ~~Arie~~ AREY, "Junior" JOhnson, and me. ~~Most~~ Some of the overtime work and weekend work was high-priority safety work. For example, there were recessed areas in the floors that contained enormous amounts of piping which required that the welding work be done in close quarters and in extremely difficult positions. This work was often done on weekends by the three of us because of its difficulty. "sumpholes"

In about ~~September~~ summer 1980 Duke began to ask for volunteers to go to Catawba. In ~~late October or early~~ mid-November 1980 I transferred to Catawba, but I was sad to leave Mc Guire. At McGuire, I had a tremendous foreman, with whom I had a good working relationship; I had a good reputation there; also, I had heard a lot of things about Catawba that I did not particularly like such as no adequate rest room facilities and no canteen to provide cokes or coffee. I was even more concerned about the comments I heard about the Catawba management. Going to Catawba was considered by many workers as being sentenced to Siberia, but jobs were hard to find -- so I went.

I had some expectations of what my job was going to be like at Catawba. The week before we were supposed to go down there Bill Rogers, who was welding superintendent of Catawba, came to McGuire and was going to meet with the welders who were going down to Catawba. He was going to tell us if there was any difference between the welding operation at McGuire and the one at Catawba and what we could anticipate. If we could not make that meeting we could send a designee to that meeting for us. Unfortunately, my ex-wife had me in court on that day for increased child support. I asked my foreman to go to that meeting for me. He asked Bill Rogers if there were any openings in the pipe fabrication ("fab") shop. Because I'm a large person it is hard for me to get into some of the tight places that welders have to get into. My foreman realized that I could do good x-ray quality work, and he thought it would be advantageous to everybody if I was put in the pipe fab shop where I could be out in the open and get to the pieces I was working on with relative ease. I was able to do the good, high quality work that was needed in that area.

Mr. Rogers promised my foreman that that was where I would be put when I arrived at Catawba. Naturally, when I went down to Catawba in November 1980, I had every expectation of being put to work in the pipe fab shop. That did not turn out to be the case. Instead, I was assigned to Larry Rudasill's crew (Bobby Hoyle was the foreman when I arrived). I knew that the pipe fab foreman was Deacon ~~Decon~~ Jones and I asked the woman in the office if there had been a mistake, but she told me there had been no mistake.

I believe,

Larry Rudasill's crew's primary work area was the refueling canal and the annulus in Reactor Building Number 2. I was first assigned to work in the bottom of the refueling canal in close proximity to the reactor putting stainless steel liner plates onto the angle iron embedded in the concrete wall. This was safety-related work; all of the metals had to have non-destructive tests ~~or~~ (PT) done on them.

I could not believe management's attitude toward workers at Catawba. Whereas at McGuire if there was a problem with a work assignment you went to your foreman and talked about it, as reasonable people, at Catawba it was much different. For example, because I was expecting the pipe fab job and got a different assignment, I asked for a meeting to discuss it. About two weeks after I arrived at Catawba Bobby ~~Hoyl~~ Hoyle, my foreman, Billy Smith, my general foreman, and I finally had the meeting I requested. I just wanted to clear the air and find out why I was being placed where I was, rather than in the pipe fab shop.

Billy Smith commenced to tell me first off "I would work where I was assigned to work and if I didn't like that I could hit the road." He pulled out my calendar from McGuire and then said that I had an awful attendance record for the previous year, that I had been out 19 times. I told him that was ridiculous, that there was no way I had been out any 19 times. He pointed to my attendance on the calendar. There were approximately 12 Fridays that were marked that I was out. I was astounded by Mr. Smith's naivete. Those days were "early outs!" It was normal policy that if a worker was going to work Saturday and/or

Sunday, he could get off early on Friday, around 3:00 or 3:30 to get his check cashed. That way he was clear to come in on Saturday and Sunday. That's what happened on a dozen of those nineteen absences. The other absences -- ~~in over a two year period~~ during this period -- were either illness or court dates resolving conflicts with my ex-wife. I tried to explain that this was normal practice, called an "early out." My foreman at McGuire was told by the Duke personnel department that if a man did not work a full day just to shade it in, light blue. But it was not anything detrimental to a worker, and in my case he would find that I had worked from eight to ten or twelve hours on the Saturdays ~~and~~ and/or Sundays after the "early out."

I attempted to clarify this with ~~Bill~~ Billy. I told them about coming to work on Saturdays ~~and~~ and/or Sundays and that I was one of at least three people on my crew who did this. I told them that if they did not believe me to just call my foreman at McGuire and he would verify that what I was saying was true. Billy Smith responded by telling me that it was not the way they did things at Catawba; that any part of the day that you do not work goes against your record. I terminated the meeting pretty quickly when I saw that I was not going to get anywhere with them.

I went back to work in the refueling canal. For approximately three months I "Tigged" the plates on the containment wall.

Larry Rudasill took the crew over from Bobby Hoyle soon after I started. He found out that I was efficient in making repairs and soon I was doing nothing but making repairs.

As soon as I became a repairman I identified a serious problem

with laminated metal used for piping on the containment wall in the Unit 2 Reactor. The containment wall is, to the best of my knowledge, three-quarters of an inch thick and it runs the entire height of the building and across it. It is put in in sections and solidly welded and installed. All this work was done prior to my getting there. These sections are formed together to make a big barrel; this is the containment. There are holes cut at specific places and there are stubs of pipe that are already welded in there. These are vendor welds. I was told that these were done by another company who supplied the steel. It was to these that we welded bellows to allow the wall to expand under pressure.

We had one weld on the second course. It was on the NI system. I do not know how long it had been welded prior to my getting there, but it had x-rayed as a bad weld several times. Shortly after my assignment there, a fitter was down there working with a torch. He was cutting the bellows off the stub of pipe that came through the wall in order to do some repair. I was aware at that time that they wanted to do something different than usual in fixing it. The bellows had x-rayed as bad so many times that they decided, I guess, to just cut it off the wall and try again. I was doing repairs in the various parts of the annulus when they prepped the surface up again to put the bellows back on, This was on the NI system and, to the best of my knowledge, it was 24-inch diameter pipe. This was one of the first times I became aware of a lamination problem in the steel stubs of piping there. I believe the weld was either 2NI-16-2 or 2NI-16-22.

HSN

I also noticed problems with the stiffeners on the wall. I asked some of the people down there why on these stiffeners that went around the containment wall had places been ground out so deeply beside the welds or ground as if they were removing some sort of defect. I was told that there were literally not inches but feet of lamination that had been found in the metal itself.

A lamination ~~is~~ can be HSN 11-16-83 an extremely dangerous flaw. It had been explained to me, by several people more knowledgeable than I am, how steel factories work; that in order to make sheet steel, molten metal goes through a press and is heated and pressurized, then it is rolled through again. Sometimes in the rolling process some of this steel bunches up and it starts rolling back under and it actually does not fuse. It is red hot but it does not fuse with the other steel. So, there are layers of steel, like layers of formica. The area that is not fused together is called a lamination. Several people down there told me that several places on the containment wall had been ground and rewelded, and ground and rewelded, in order to take care of laminations.

There was a procedure that Duke Power had, called CP-88. CP-88 instructs HSN 11/16/83 ~~allowed~~ workers to grind three-eights of an inch deep into a lamination when it was found. Once the welder achieved the proper geometry, ~~he would clean it up and~~ HSN 11-16-83 it was supposed to be HSN 11-16-83 signed off by a QC inspector. Then he could fill this back up HSN 11-16-83 ~~with either TIG metal or stick rod metal,~~ HSN 11-16-83 then grind the surface flush, have a QC visual inspection done ~~it back off,~~ then ~~do~~ have an NDE test ~~on carbon steel~~ done (must be done.) to resolve the problem.

HSN 11-16-83

HSN 11-16-83

I became a little bit suspicious that perhaps this stub of

metal that had been vendor welded in, was perhaps just a rotten piece of steel and had too many ~~laminations~~ flaws in it. I asked some of the fellows who had worked on that pipe before, and who had repaired it before, what type of defects had shown up and they had all been similar linear defects. ~~On the x-ray there would be a weld running straight and it would have a line through it.~~ To me that would indicate, perhaps, a lamination.

I did not believe that so many welders could have welded badly for that long. So, rather than the normal magnetic particle test, I suggested to Mr. Rudasill that maybe we could get a penetrant dye test done on it. I knew that if it did not "shoot good" the next time, the repair was going to come back on me since I was the repairman.

For the penetrant test the steel is cleaned off and dye put on for a certain amount of time. Then it is cleaned off again, the dye sits, and then a developer is put on it. If there is the slightest crack, even a ten thousandth of an inch, it will start bleeding through and red lines will appear. That will indicate that there is something wrong with the metal.

Mr. Rudasill agreed that even though this was carbon steel, and magnetic tests were normally done on carbon steel, perhaps the penetrant test would be the best way to go on this pipe.

I was working down in about the same area when the PT tester, named Keith(?), came down to do the penetrant test on this new surface. It had been bevelled at a 37.5 degree angle and it looked good to the naked eye.

This first test showed up, if I am not mistaken, with 30-some laminations in this piece of pipe. That would be roughly six feet in length and the prepped surface would be about two inches wide. Some were as long as an inch to an inch and a half and some were as short as one-eighth of an inch. Unfortunately, my theory had come true. It was, in fact, just a rotten piece of pipe. Were it my plant, I would have taken that piece of pipe out of there.

CP-88 was the procedure I was told to use to try to fix those laminations. However, CP-88 had nothing to do with the stubs of pipe that were welded in the containment wall. CP-88 was only for the metal that the containment wall was built out of.

I know how bad the lamination problem was because I would ask the PT man how the testing was going. Once he put the developer on the pipe and the bleedthrough started showing up, he called me and told me he wanted me to look at the wall. He told me he had never seen anything like it in his life, and I agreed. I thought quite probably that Tech Support would say we were going to cut a piece out of the containment wall, do away with this stub, weld a stub of good pipe into a square and put this back into the containment wall, then make a 100 percent x-ray weld and that would be the end of it. But that is not what happened.

Instead, the foreman decided to just keep fixing it. Although I did not actually work on getting these laminations out, I know that CP-88 was used, and several welders I knew worked to get these laminations removed. I would ask the workers, Roy Brady, for instance, at the end of the day, how it went that day and he would

tell me things like, "today we started out with 28 laminations and now we have got it down to 25."

There was not a new NCI written for every repair on that piece of pipe. Although I was not sure, I believe that the correct procedure was to have documents for every repair on ~~a different weld~~ each indication. But the PT guy would just come back and check it. If we had improved anything, fine; if not, we still had areas to continue to repair.

It took two, perhaps three weeks, to finally get that surface to where nothing bled through. Although I am not a metallurgist, I wondered all the time how all this repair work resolved the problem of the piece of pipe itself being bad. Doing spot repairs by grinding 3/8ths of an inch deep and filling it up with metal and smoothing it back over does not eliminate the lamination in the pipe. There is no way to know how far into the pipe the lamination goes. Only ultrasonic testing can determine that. ~~For instance, a welder may go the entire distance all the way through the pipe.~~ Of course, this was supposed to be none of my concern; I was the worker and not in supervision.

Finally, somebody got to weld the bellows back on. Once again it shot bad. There were approximately five bad indications and they were linear type indications, as they had been before.

As I knew it would, the repairs finally dropped in my lap. Instead of ~~fixing four little pieces together~~ working on five separate areas encompassing the five, I just opened up two long areas. The long areas could be described as being clockwise from 12 o'clock down to almost 3 o'clock, and another area that picked up at 4 o'clock and went on around to about 7 o'clock.

To begin the repairs

In this area I took the arc air and very carefully cut the weld metal out. After I ground and buffed these two areas, they looked like new joints to be welded. I almost went all the way through the pipe (i.e. removed all old weld metal). Then we called PT back and the laminations showed up again. I was told by Mr. Rudasill to take the M-4A form for the repair "up the hill" for resolution. We were going to use CP-88 again on it.

There were four people who had to sign off on any resolution. One was quality control, one was quality assurance, one was technical support; the final signature that had to go in a box on the form was from the ANI ~~(American Nuclear Institute)~~ inspector. I understand this man was from Aetna, the insurance company on Catawba. It had been my experience that their word was law, and whatever they said was final.

The process of getting the signatures took me about half a day. I finally got everybody's signature that was needed on the form except the ANI signature. Then I went down to their office. A Mr. Cosgrove was there. I had heard before out on the job site that he was the top ANI man, or the most knowledgeable person on the site. I asked Mr. Cosgrove for his signature so I could proceed on repairing this weld that had shot bad again. He wanted to know the details behind it. He asked me what CP-88 was. I told him it is the procedure used to repair laminations in the containment wall. He commented that this was not dealing with the containment wall, that it was dealing with a piece of pipe and with that pipe weld. I confirmed that but told him that I had been told to use CP-88. He got

his book of construction procedures down and he looked up CP-88. He hit the ceiling. He started pacing up and down the office and he said he could not believe it. He said he did not even know that a CP-88 existed. He asked me if CP-88 had actually been used on the containment wall. I told him that I had not seen it used myself, but I understood that was what the procedure was created for, to eliminate the laminations as they showed up. He told me that did not "eliminate a damn thing." He said all that CP-88 did was to cover over something but that the problem was still there. He told me that he was concerned that this procedure directly affected the safety of the Catawba plant. He told me to give him the paperwork. So I turned the paperwork over to him. He said that he was going to have to take the paperwork home with him to think on it, and he reiterated that as far as he was concerned it directly affected the safety of the plant. He even said that he may have to "shut the place down." Then it was out of my hands.

I went back and reported to my foreman about what had happened but he did not seem too concerned with it. He just told me to do two more repairs that had shot bad.

The word got out that Mr. Cosgrove was pretty mad, but I did not hear any more about the welding. I went ahead and taped over the two cuts that I had made with yellow tape and went on about my business making the next repairs as Mr. Rudasill had instructed me.

In about two weeks' time the paperwork came back to Mr. Rudasill and he turned it back over to me. ~~He~~ I started working on

the weld again. I am not sure whether we used another procedure, CP-123, or CP-88 to do the repairs. CP-123 was often used to "butter up" a "prep" surface to achieve proper geometry. Rather than grind 3/8ths of an inch deep, I went ahead and really opened some nice grooves where these laminations had shown up. I went about 3/4ths of an inch deep. I wanted to make sure if there was anything there that I was going to try to get everything out that was bad. As I always did, I would blend the ends and sides out so there would not be any abrupt starts or stops. Once I gouged these places out and cleaned them up, I had an inspector look at them and okay me to continue to do the repair.

Through my extra effort the welds shot good the first time, at least in that weld area. This really concerned me because the repairs still did not solve the problem of multiple laminations. For example, although I did not see it firsthand, I had seen these welds on the stiffeners. The workers had taken grinders and ground too much metal away from the weld. There is not very much grinding involved when a good welder does a weld. I worried then, and I worry to this day about how much metal in that containment wall is laminated and could perhaps somewhere along the way cause a safety problem. If something blows in that plant and there is a little crack and the pressure starts opening it up, it could cause a rip and tear that could possibly splinter the containment wall. If the containment wall goes, I do not know how much radiation could get out of it, and I do not know how many people could be hurt, but I do know I am concerned about it.

I was and still am convinced that the vendor who supplied the steel and Duke fell down on their responsibility to insure that the materials used in the construction of Catawba were of the quality needed to build ~~an~~ as safe as possible nuclear facility. I often wonder if the department that was supposed to inspect materials received on the site actually checked out the reactor containment plates. On several of the pieces of steel I saw the words "Deliver to Doug Beam in care of Duke Power Company." I wonder if the fact that the materials being shipped to the project manager, by name, exempted them in some way from complete receiving inspections.

Even if that happened, I think Duke fell short in its responsibility when I pointed ~~out this one hole that I am speaking of,~~ a hole in a vendor weld. 3/8ths of an inch deep. I pointed it out to an inspector, I pointed it out to my foreman and asked them how in the world we could ignore something like that. To the best of my knowledge, nobody made any effort to file a report on it, or to put an NCI on it, or to do anything about it.

To the best of my knowledge, CP-88 was created to "cover up" the problems. But according to Mr. Cosgrove, and my own suspicions, it does nothing but disguise the real problem. It does not eliminate the problem. I questioned the possibility that if there was one lamination four feet long, couldn't there be 50 that have not been found.

I believe that the incident with the laminations and the CP-88 procedure put my Catawba supervisors on notice that I was not going to "look the other way" at construction flaws. Because of my

conscientiousness in this incident, as well as others described below, I believe that Duke used my later health problems as an excuse to get rid of me through the Employee Relations Department.

Another example of poor quality work on the containment vessel itself was the vendor welds. These welds, which were done prior to the installation of the containment plates at Catawba, had numerous flaws. These included porosity, lack of fusion, holes, and were generally just shoddy work. The vendor welds were located across the entire containment wall. In one vendor weld I found ~~several~~ one hole 3/8 of an inch deep, which I mentioned on the prior page.

The containment wall is only 3/4 of an inch thick. A 3/8" hole is 1/2 of that thickness, or 1/2 of the strength of the containment vessel at that one point. I do not know how this poor quality work actually happened, but I pointed this up to one of the QC inspectors, I believe it was Harold Eubanks. I also pointed it up to Larry Rudasill and asked him why we welders had to be so perfect with our welds when the vendors could get away with junk like I have described above. He told me it was because the vendors are the ones that are responsible for the welds, not us. I asked him what about an accident on the site, such as Three Mile Island. I told him that people are not going to know or care who made that bad weld - all they are going to know is that Duke Power had an accident at Catawba. To the best of my knowledge, bad vendor welds were never touched. As it was told to me, that was not our responsibility. (The weld with the hole in it was located approximately in the fifth course in the Reactor Building Number 2 annulus.)

Yet another deep concern of mine, which came to light when I was a repairman, was the inaccurate identification of problems by the x-ray department. When I worked with other companies, the x-ray departments were top quality. I remember one job in particular up in Williamsburg, Virginia, where I had done 148 feet of weld. I had one half inch of weld that was rejectable, and when the x-ray man told me it was bad and in what particular place, the flaw was exactly where he called it. At McGuire, also, the x-ray department was pretty accurate. If x-ray called a "bad spot" somewhere and a worker cut into the metal, pretty soon he would start finding what they had called. If they called porosity, the worker would start seeing a few dots of porosity. If they called slag, he would start seeing some slag and with lack of fusion it was the same way.

At Catawba, however, I did not find this to be the case. For instance, the x-ray department would call a half an inch of lack of fusion on the weld and it would appear to be in the center of the weld. I would start cutting there lightly with my arc air and start gouging deeper and deeper. The deeper the cut, the longer the elongation to facilitate smooth transitions.

At Catawba I consistently found that rather than the defect being where x-ray said it was, it would be somewhere else. Often I would be almost all the way through the pipe, and no defect would be there. I could tell by the color of the metal that I was almost through the pipe and, in fact, sometimes I did go all the way through it and never found the flaw. (That is allowable to do, to

open it up and to run a new ~~route~~ root pass in, but it certainly is not desirable to have repairmen doing ~~grinding~~ needless work just to find flaws that do not exist.)

What was even more upsetting, however, was when I would find a flaw that x-ray had not identified somewhere else in the pipe. I would be digging into a pipe at the location x-ray identified, and I would find, for example, a patch of porosity the size of a silver dollar five inches from where x-ray had identified one-half inch of lack-of-fusion. The practice of the x-ray department to identify incorrect problems in the wrong locations concerned me greatly. I wondered how many problems remain unidentified.

Many times, I brought these concerns to the attention of Mr. Rudasill, and ~~other~~ inspectors, or anybody who would listen. I just could not understand it. My foreman would try to explain it away, saying it was just from the angle that they shot it, but I did not believe it. It happened too many times. This led me to wonder how many were good that were called bad, but more important, how many were bad that had been called good.

Usually I would go ahead and dig the area out that I found as bad and then reweld it. After it was re-x-rayed it would show a new defect where there previously had been none. There was no consistency.

To elaborate on this a little, when I was on Henry Best's crew in the Number 2 RBS area in April 1982, one of Henry's better welders had an experience with the x-ray department, which he told me about.

I was standing beside Number 2 RBS one day and Mike Pridemore came in raising "holy dickens." He told me that a weld he had made about a year and a half ago had just been called bad. He said that the x-ray department had already accepted it, and sent it to QC and QA, and the approved finished forms were locked away in the vault. (That meant the work was finished and accepted, ready for systems turnover.) Then a design change required that a valve be added into this line. So they made a cut and, I believe, John Bryant looked up in the pipe and could see the weld. It was maybe two feet down from him and had already x-rayed "100 percent good." He saw drop-through, unconsumed filler material, and a bunch of things inside on the root pass that would have made the weld absolutely rejectable. That was in the Unit 1 Reactor Building. This weld was in fact then "red-tagged" by Bryant, or one of the inspectors, and Mike Pridemore was charged with so many inches of bad weld on his record. That weld had to be redone. This is just one example where the x-ray department had approved something that later had to be repaired.

While I was on Mr. Rudasill's crew other people on the crew would come to me from time to time and discuss problems with me that maybe they ought to have been discussing with the foreman. Maybe I was a little more outspoken about problems and working conditions. In any event, once in late spring 1981 we had a batch of bad carbon TIG wire. When a worker is using the TIG process, he holds a TIG torch in one hand which has a nonconsumable tungsten

that extends out from it. He starts with his arc and it heats the metal. This is never supposed to touch the metal, so the torch is held with the right hand, and with the left hand a piece of filler is added in. The TIG wire we had sparkled like a Fourth of July sparkler. We would be running along on a weld and it would sparkle, flake, and get all over the tungsten. Good welding procedures require stopping at that point to identify the problem. If the deposited material had porosity it had to be removed. In this case, welders were definitely having problems with the wire.

Carbon TIG wire comes with a copper coating on it as a protective device to keep it from rusting. As we started sanding it off we would find an area, like a seam, where it would be rolled over and down to find out what the problems were. In that seam there was filth and trash. All of the fellows on Larry Rudasill's crew delegated me to be the person to go up and present the bad wire stubs to the foreman and tell him what was going on, which I did. I am not sure whether Mr. Rudasill or his "lead man," Danny Wallace, was running the crew that day. I explained the problem and gave him the little bundle of TIG wire from all the welders. I told him that each welder had given me two or three stubs and I had a whole piece to show him. I sanded it off and showed him how bad it was. I told him that somebody needed to know about this and that maybe we needed to scrap this batch. Either the lead man or Mr. Rudasill carried the problem back "up the hill" to his superior, Billy Smith, who was our general foreman.

The word came back to me that I was paid to weld and to weld with what I was given to weld with." I was told that that wire had been sent to the test shop and a couple of tests had been run on it. I was told that there was not a thing wrong with it, and for us to go ahead and work with what we were given to work with. Billy Smith, through Rudasill, also said that our crew was the only one that complained. The message for us to keep working and not worry about quality was very clear. The wire continued to be bad until that lot of wire was used up; and when the next lot of wire was purchased, we did not have that problem anymore.

We had similar problems with the 3/32, 7018 stick rods. There would be a period as long as a month where not just my crew, but every welder on the job seemed to be having the same problems with the stick rods. We were picking up mainly porosity. For example, I would look at the rod and halfway down it there would be a split in the flux. Flux must be bonded to the rod properly, or it will just drop off, creating porosity. After a welder has this problem so many times he gets pretty disgusted. I know that the attitude of many welders toward bad rods was to just keep welding. Then the porosity would get covered up. I am concerned that the bad wire and rods have left an undetermined number of bad welds at the site. Although I raised these problems many times no one in supervision wanted to hear them. Their attitude was to get as many welds done as quickly as possible.

There are other examples of these problems -- laminations, bad

welding rods and wires, and situations where the x-ray department failed to identify flaws in pipes or welds. Those that I have described, however, are illustrative of the type of activities that were a daily occurrence at Catawba.

During these months I got along well with my co-workers. Even though I was troubled about the quality of construction, I was not too worried about retailiation or harassment from my supervisors, although it appears now I should have been.

In the fall of 1981 the Catawba workforce went through a major shake-up. Although I never knew the details or the cause of the shake-up there were major changes during the fall. Rumor on the site was that Catawba had done very badly on some NRC inspections. There was a marked change in the attitude of the craft supervisors to QC inspectors who found hardware problems, and to the construction workers like myself who were known to argue with foremen over bad construction practices.

I sensed that I was on the "list" of people who were to be gotten rid of because of the CP-88 and TIG wire incident. It was a mistake on my part that gave Duke the first of many opportunities to make my life as a Duke employee miserable.

During November 1981 on one of my repairs I skipped a "hold point." I had ground out what I felt was the bad part of the weld I was working on and had started putting the new metal back in it. I was first to have gone and gotten a QC inspector to look at it to make sure it was clean. He would check the paperwork and sign

it off. I just got in a hurry and forgot to get him to sign the clean up off and went on ahead and started putting new metal back in it. Soon I realized my mistake, and immediately went to get the inspector. He wrote an NCI or a rework on it.

In the past, having an NCI written on your work was a professional embarrassment. The paperwork that you were working with was taken from you by the inspector and it was sent "up the hill" for resolution. Then it was sent back to you. Workers were verbally reprimanded by their foreman to be careful and not to let it happen again; they knew you skipped up on a point.

Normally, what I would have to do to rework the weld would be to take out all that metal that I had put in after skipping the hold point, let the inspector sign off what he was supposed to, then finish the weld. That did not happen. I got a verbal reprimand and was told that more than likely this was going to result in an "A" violation," which was a disciplinary measure. I screamed to high heaven, "How in the world can this be? This is the first one I've had like this and I've been making all the repairs. I've had ten times the paperwork on me that anybody else does." Not only had I not heard of this happening before, it also was not fair. As a repairman I had to go back and redo work that others had messed up and therefore had many more hold points than others would have. I was the first one that I had known to have gotten an "A" violation over something so insignificant. Others had had similar things happen to them and they had gotten only a verbal reprimand.

My "A" violation came about two weeks after the skipped hold-point incident occurred. I was called up to the office. My fore-

man and Billy Smith were there. I was told that the NRC had mentioned that so many NCI's were happening on the job that DPC decided a reprimand was not going to be enough any more. They said they were going to have to take stricter and sterner measures to prevent this from happening. This was going to be the new policy.

I did not believe it. I told Billy Smith and Rudasill both that I would ~~accept~~ sign this violation, but I had better not find out that anybody else on the job was being "red-tagged" (NCI'd) on any of their work and was not getting an "A" violation or I would be back up there screaming. I went back to work.

Shortly thereafter I was transferred to the night shift. Larry Rudasill just came up on a Friday afternoon and told me that I would be going on the night shift on Monday. I took this as a clear message that I was being punished. It was common knowledge that Billy Smith used transfers to the night shift, or places like the cooling tower, as punishment.

This transfer caused me hardship. I had bought a new car to get back and forth to work and was running a car pool with other workers from my area. This shift transfer just destroyed it. I was counting on the riders that I had on the day shift to help make the payments on that car. It was a pretty low blow.

On the night shift I worked on Unit 1. Once again I was doing repairs. My new foreman, Arlon Moore (Billy Smith's ~~brother-in-law~~ first cousin) told me after a month or so that I was about his best welder. He told me that he really hated ~~to do this,~~ see men punished but this is something that

Billy Smith was making him do. In fact, he told me that he heard me mentioned for a "lead man" position and that he was going to try to help me somewhere down the way.

I worked the night shift for about three months although I was scheduled to work it six months. J. R. Wilson took over the night shift around December, soon after I started. He told us that he just wanted us to try to work within the Code and if we got a "red tag" or something he was not going to jump down our throats about it. He told us he just wanted us to try to hold our mistakes to a minimum. I raised my hand and asked if this was his policy or Duke's policy. He told us it was just kind of the way he thinks about it. After the meeting I explained to him what had happened and asked him to get me an answer on my mandatory "A" violation, received back in November. The answer he came back to me with was that at the start of November the NRC had made it a rule that anybody who got a red tag would get an "A" violation and they had dropped that rule at the end of November. I never heard such a bunch of hog wash in my life. That rule was in effect just for the month that I got mine. So I dropped the matter.

In February 1982 I asked for a hardship transfer back to the day shift. This was important to me because my little girl was beginning to have nightmares and becoming fearful as a result of not seeing me at home. That is, I would have to leave for work before she came home from school. My wife and I could see a significant change in her personality. The hardship transfer was approved.

I came back to work on the day shift for Henry Best. This was about February or March 1982. Henry Best's crew worked the Number 2 RBS area. That is just outside the reactor vessel itself, on the other side of the wall. It is a very important area, almost everything in it is safety related. Therefore, almost everything is stainless steel piping. Henry Best supposedly had the "cream of the crop" of welders down there. It had a reputation as being one of the most important crews on the job. Henry was a tough foreman. He had to "test" you for himself for a long time. When I started I just did little menial things like tacking a hanger or a temporary hanger; first one thing, then the other. In other words, I had to prove myself to Henry. I tried to do that, but to no avail.

Even on Best's crew there were serious problems that affected the quality of construction on the Catawba site. (I described one incident on page 18.) Another of these was the problem of foremen overriding the craft people in order to meet construction deadlines. For welders this had a very personal impact. Each welder had a stencil number. Mine was P19. It was pretty much up to the welder when he was given a weld to stay within the code, to know how to do that weld, and not to exceed the interpass temperature. Then, when he gets through with the weld, if it is thicker than a quarter of an inch, he takes the hammer and knocks the stencil number on it. It is like a signature and it is going to be there for as long as the plant is there. A lot of people take pride in

that, and a lot of people do not. I always have, but it puts a lot of pressure on a person too. If something breaks later on, the welder's stencil number is on it, and everyone knows who the man is who did it.

I was never overridden too much personally in the way I would weld something. Mr. Rudasill did override me a couple of times to make something look more uniform, specifically on a cold bell on the wall. But in a case of a welder who has not had years of experience, when a foreman overrides him it implies that he is doing something wrong.

When I first went to Catawba, a man named Malcolm Young had an experience with this situation. Some crew cut into a line that Malcolm welded on two years previously, a Class G weld (We were told that Class G should be welded like Class A.), and Malcolm lost his stencil because of it.

Malcolm told me he well remembered that weld. He was on night shift at that time, and the fitters made a sloppy fit on it. They did not put the proper bevel or proper land on it. They slopped it together. He went to his foreman and told him about it. I do not know who his foreman was, but Malcolm told him the fit was "stove-piped." The foreman told him it was just Class G and to go ahead and weld it out. But it gapped open in one place and was slammed together at another; it did not have the proper gap or proper land. Malcolm has about the same number of years of experience that I do, but he lost his stencil and had to retest. He came very close to quitting. What happened to him was known all over the job.

If a man is going to be given a stencil and given a responsibility, then certainly a foreman should stand back and let a welder do it to the best of his ability. If he does not have the ability, then he should not have had the stencil to start with.

Another example of overriding occurred when I worked for Rudasill. I was set up on the floor above us in the Reactor Building Number 2 to work with Ed McKenzie's crew. They cut up one-foot lengths of stainless steel pipe that was to be joined to 90-degree couplings. They wanted me to tack them in and said the paperwork would follow. But I refused to tack them in until I had gotten the paperwork and my foreman got on me about not tacking them. He said the paperwork was coming. I told him that I did not have it yet and that I was not going to do it.

I was very concerned about this practice when the pressure to get the plant done increased. It is so easy for a welder to, for example, have a groove that is a half-inch deep and then fill it up with root metal and put a nice cap on it. A QC inspector or foreman could look at it and think it was all fine but there would be no way to know it was a weak weld unless it was x-rayed properly.

Because QC inspectors did not come to inspect until welds were completed, the workers could do any quality of work they wanted. Because the foremen actually were "inspecting" work, they had the authority to make on-the-spot changes that would never be detected by QC inspectors. Foremen on the site knew which workers would put up with the pressure and which ones would not; it was a constant struggle to try and do the job the way it was supposed to be done.

Many times I was told by my foreman to do work "his way" -- there was a saying on the site: "There is the Duke way and there is the highway." This meant, of course, that a worker would be fired if he did not do it the way his supervisor said.

Another saying that foremen used was: "You do what I told you to do, not what you know how to do."

In the Duke Code of Conduct, violation A 11 reads, "Failure to follow instructions, either written or oral" will result in an "A" violation. If a worker gets three "A" violations he can lose his job. So workers were often in the difficult position of choosing between following the foreman's instruction or following proper procedures; that is, violating the laws governing nuclear power plant construction or risk losing their jobs. In other words, you were "damned if you did, and damned if you didn't."

This was particularly bad on Henry Best's crew. As I said before, Mr. Best had one of the best crews on the site. He also had three workers, one of them myself, who were dumped there to teach us a lesson or try to get rid of us. Best's crew was responsible for welding the cooling loops for #1 and #2 reactor with a special welding process called the heavy wall TIG process.

None of the three of us, myself, Woody ~~Walterscp~~ Walldrop or Jerry Wilkinson, were allowed to do the heavy TIG welding. In fact, we were only allowed to do menial labor, like cable tray supports. Once Woody got so fed up with things harassing him that he hit the ceiling. I heard him tell Henry that he was "sick and tired of doing garbage-shit work," that Henry hadn't given him any decent

work to do for months. Woody told him that he wanted a transfer to another crew or a check. ~~He got a transfer.~~ Jerry was also very frustrated, he was a 13-year, well-liked welder from ~~Cherokee~~ McQuire. He decided to put up with it, put in his time and draw his check. I kept trying to have Henry give me some work -- finally he let me take the heavy metal TIG test. I passed the first time.

However, two weeks later, Henry came and told me that the ANI man had pulled my test weld and rejected it. He didn't offer any proof, and I didn't believe him - I knew I passed. I just took it as another kick in the teeth for trying too hard to get back to decent work.

I felt continually under pressure at the Catawba site. I wanted to do high quality work. In fact, I took an extreme amount of pride in the welding repairs that I did at the site. My reputation as an excellent worker was very important to me. However, it was becoming increasingly apparent to me that the Catawba management did not want high quality work, they just wanted to get the plant finished as quickly as possible. It seemed that every problem that was identified, every "red tag" that a welder got caused supervision to get meaner and meaner with the work force or the worker. Because I had earned a reputation as being a worker who identified problems and was not afraid to bring them up to supervision, the pressure on me was getting intense. I felt as if the only reward I was getting for being a conscientious employee was a "kick in the teeth."

TERMINATION

The pressure at work eventually began to affect my health and my home life. I was also receiving an extreme amount of pressure from my ex-wife for more and more child support. The arguments at work over construction and the arguments at home over money, and the arguments with my ex-wife over child support threw me into a depression. Everywhere I went there was more and more pressure, and I felt there was no one to support me.

In April 1982 I began seeing a private physician concerning this problem. He recommended that I begin taking a "mood elevator" to relieve my depression from the numerous pressures I was under. I had been under a "cloud of depression" for some months.

Unfortunately the doctors and my family underestimated the "tail-spin" that I was in. In July 1982 I had to be hospitalized for eight days for a period of deep depression.

Following the hospitalization I returned to work. The doctors who were treating me attempted to find a "mood elevating" drug which would lift my spirits and bring me out of the state of mind I had fallen into. Although they sincerely tried to help me I believe that they made matters worse--switching medications frequently and paying little attention to the physical side-effects of the various drugs.

Besides that, things at work continued to degenerate. After my hospitalization I felt more isolated from my co-workers. I confided in my foreman about my problems, and he seemed sympathetic but it did not change the situation. The work atmosphere was still the same -- pressure to get jobs done in a hurry with no attention to quality. The morale of the entire workforce seemed to be at an all-time low. Many of the workers who did talk to me sympathized with how difficult it was to come to work and do work that we knew would just be ripped out on the evening crew and have to be done over again the next day. The tension at the site was terrible.

In November 1982, after checking my rods out, I had a grand mal seizure on the job. I had just started to check my rods out and soon after 10 o'clock I woke up in York Hospital and my head was being sewed up. I had fallen down and had kept attempting to get up, and get up, and my head had gone underneath a little shed they had there with sheet metal to the bottom of it, and every time I would get up I was hitting my head on the sheet metal. I was out of work for eight days.

I had had HSN 11/14/83 a previous seizure in 1968 after I had gone through five or six days of extreme, heavy work. The cause of either of these seizures was never pinpointed.

I returned to work after this medical absence. I was assigned to Herschel Brewer's crew doing very menial jobs such as welding hand rails, etc., on ground level. I was welding for the steel-riggers. As stated before, I had volunteered earlier to work in the pipe fab shop. Having the good x-ray record that I had and the experience I had, I felt I could pass that on to the company. Because I was now required to do ground level work I volunteered for the pipe fab shop again. I was still told that I would not be put there. I was going to be put on welding ~~fab welds,~~ handrails HSN 11/14/83 etc. for the steel riggers. This was a slap in the face. I had been a good worker for Duke Power, and was highly qualified. My personal problems did not make me a bad welder. For years the workforce had known that some of the top level management on the site were alcoholics, and they still were allowed to supervise construction of a

nuclear plant.

During the spring of 1983 the job situation was painful. It is almost impossible to describe the effect that having nothing to do and no one to talk to for eight hours a day, five days a week has on a person.

Although I knew, pragmatically, that all of these actions were being taken to get rid of me I was determined to keep my job. I was then, and still am, a good welder. I continually asked for work but it was of no use - the message for me to quit was very clear. For days on end I would be given nothing to do. Then if I was given some work, it was meaningless. If I was ever caught sleeping on the job, it was a "C" violation -- a ~~fireable~~ serious offense, so I did not even dare to sit down. There were many, many days of this just "marking time." The work situation was also affecting my health. It was more and more difficult to go to work, I would actually get sick on the way to work at times. During March and April I took about a half dozen vacation and sick leave days. Each of those sick days counted as an occurrence.[1] I do not know why my absences mattered. There was nothing for me to do at work anyway.

About the third week of April 1983 my supervisor suggested

---

1. I was told that an "occurrence" is any day that you did not work the full day, even if you were missing only one hour. Any day that you were tardy, or that you left early, that you were sick, had a doctor's appointment, or you called and said that your house was on fire and you would be late, or you called and said that your child had been hurt and you had to leave, all of this, any of these statements would count as an "occurrence."

that I talk to Employee Relations about going to the Employee Guidance Program in Charlotte. I welcomed the opportunity to do that. I just wanted things in my life to go back to normal.

The Duke Power Employee Relations Department was a maze. In retrospect I can see that the Employee Relations Department was really a trap. Ms. Williamson at the Employee Relations Office apparently knew something about my personal problems. I think Mr. Brewer shared this information with her but I did not mind because she seemed really interested and concerned. I trusted her. She explained to me that none of the times that I would see doctors or psychologists at or through the Employee Guidance Program -- be it one time, four times, twenty times -- would count as an "occurrence."

The next morning I had an appointment with Eddie Young of the Employee Relations Department. He identified himself to me as a certified or registered psychologist who worked for Duke. He also told me that he had been an engineer at McGuire and had done all the cable tray drawings for the Auxiliary Building there. Then he asked me about my problems. I explained to him that all I wanted was to do a full day's work for a full day's pay, but that the job situation was intolerable. I explained that I wanted to reduce down to nothing the various medications that I had been prescribed for nerves, pain, and my seizures.

He referred me to a private clinic in downtown Charlotte, where I had to explain my problems all over again. But instead of helping me, the doctors at the Eastover Clinic just made things worse - instead of taking me off medication they just prescribed something

HSN

else for depression. I tried to explain that I just wanted to work and live my life without medication, and that the latest medication made me physically ill.

Unfortunately, because the Duke Employee Relations Department had sent me to this clinic, I was stuck with it. While I went to this clinic, the doctors' visits and related absences would not count as an occurrence(s), whereas if I went to a non-Duke referred doctor each visit would count as a separate occurrence, unless Duke set up an approved medical absence program for me with them. If they did this, these visits would "possibly" count as only one occurrence. I should also point out that seeing Dr. Humphrey and Dr. Williams was costing me out-of-pocket $37.50 per visit plus lost time from work. Not only could I not afford this, they were not helping me either.

Finally in mid-May I had had it with the Duke-referred doctors, the Duke-referred psychologists, the Duke-referred psychiatrists, the Employee Guidance program, and the Employee Relations Department. I tried to switch to a personal physician, and in fact took three more "occurrences" (partial day absences) to see him, but working with a doctor who did not understand all the various and ridiculous Duke programs was futile. It did not matter that the doctor was helping me, he could not take the additional time to send all the letters and supply all the required Duke forms.

I felt trapped and I felt I had no choice but to stay in Duke's trap -- my health, my paycheck, my future, and, most important, the wellbeing of my family required that I stay within the Duke "family circle."

I had requested a meeting with J. R. Wilson and Herschel

in late May 1983 #10 11/16/88

Brewer ~~on Monday, May 17, 1983.~~ I told them that the previous week I had not been given one piece of work to do and that I couldn't work with nothing to do. I said that I was tired of being harassed and intimidated. I went back to my original problems when I was brought over to Catawba and laid all of my concerns on the table - these included both the harassment and intimidation, as well as the hardware flaws. I told them that the Employee Guidance Program was just a management tool used to play games with the workers.

After I had my say Mr. Wilson very calmly told me that if I wanted to keep my job I would learn to do things "the Duke way." #10 11/16/88 Neither J. R. Wilson nor Hershel Brewer nor anyone else at Duke ever told me that I could go to the NRC if I had concerns about construction problems. My understanding was that only top Duke management personnel could go to the NRC.

I was also not told about the Department of Labor provisions, 42 U.S.C. §5851, which provide for protection of nuclear employees who are being harassed and intimidated for trying to do their jobs.

If I had been aware of these protections I would have gone to both government agencies.

Faced with losing my job or trying to keep the one I had I went back to the Duke "family circle." The Employee Relations people and the doctor told me that even though I had broken off relations with them and had gone to see a private doctor it was all due to my not being on the right medication! I felt as if "Big Brother" was "forgiving" me. They told me they were going to get together with my supervisor, talk it out, and lump all of my doctor's

visit occurrences (seven) into just one occurrence. Unfortunately, J. R. Wilson at the site did not go along with this agreement. Evidently, there was a big argument between the supervisors on the site and the Employee Relations Department. Then I was told that I had accumulated 15 occurrences. Despite these problems, in early June 1983 I was sent by my foreman to be recertified for the TIG 200 welding process. Recertification is required every 90 days. When I got to the office that maintains the certification printouts I was both surprised and distressed to see my name on the list as qualified. The roster said that I had "recertified" on April 11, 1983. Of course that was impossible. I had not recertified in either April or January. In fact, I had done no TIG welding since November 1982 when I had my seizure.

I believe that someone falsified my certification. Perhaps this was done inadvertently, but I am 99% sure that it was done deliberately.

There are two reasons why this concerned me. First, the falsification of my certification indicated that perhaps others who were not certified or qualified to do TIG welding were also being recertified through this mysterious "pencil whipping." Second, I was outraged that serious violations such as this went unnoticed, uninvestigated, and unpunished and that other minor mistakes by craft were used as tools to get rid of them.

After I discovered the falsified certification documents I reported it to Eddie ~~Femster~~ Feemster 1/24/1983 at Quality Control. I asked him if

HSN 11/14/83

he could possibly give me the name of the person who had falsified it, but he could not.

What is incredible to me is that Duke placed such monumental emphasis on something as minor as my absences for doctor's appointments or taking off one hour early for a funeral while they ignored the unconscionable and really dangerous practice of their own falsification of welder recertifications.

On Sunday, June 12, 1983 a close family friend died. His wife called and asked me to help arrange the funeral and be there to support her. I called my supervisor at home and asked if there was any possible way I could be off one hour early the day of the funeral. He told me no, I could not take it as an excused absence. If I took the time off it would have count as my sixteenth occurence. (On the sixteenth occurence you got written up for disciplinary action.)

I went to the funeral.

My supervisor got real mad, ~~because~~ I was given the sixteenth occurrence as a typewritten letter saying that I had violated management policy related to "occurrences." I refused to sign it. I told them that I did not acknowledge their "occurrence procedure" because I had never been given any written material on it to guide me or even to explain it to me.

Over the next several days a number of incidents occurred which led me to believe that my car and lunch box had been tampered with.

During this entire time period, they would not give me any work to do whatever, not even handrailing work. Just days and days and days with nothing to do, just sitting around.

Finally, I called Joe Coulter, the head of Employee Relations,

and asked him if he could guarantee me that I could go into work and not be harassed. I just wanted to go in and do my job. Joe told me that there was no way he could guarantee that. He told me that there was an employee recourse procedure to use, if I wanted to.

On MOnday morning I called Employee Guidance and asked them again for a guarantee that I would not be harassed if I went in to work, but they would not give me that guarantee; so I did not go into work on Monday. The same thing happened on Tuesday. On Wednesday morning my foreman called me and told me not to come in, that I had been put on "temporary medical leave of absence." I had never heard of such a leave and did not know how this affected my job status. I called downtown to try and find out who had placed me on this "temporary leave of absence," what it was all about, whose decision it was, and who was going to determine when I could go back to work.

During those next two or three weeks while I was not allowed to go to work I talked to Eddie Young and the clinic people who gave me the tremendous run around that got me into this mess in the first place. Eddie Young, Joe Coulter, Faye Fowler, John Humphrey, and Wade Wiiliams all told me to "hang tight"; but they were the same people who told me they were going to get my seven occurrences from May lumped into only one occurrence so I didn't have much confidence that anything would be straightened out. I still did not know what my job status was.

When I again asked them for help in this harassment situation where I was not receiving any work to do and being isolated they

told me they could not help me. They told me that I had to go through normal employee recourse procedures. Of course, going through this procedure meant that I had to complain through the very people who were harassing me, and up the same chain of command that had made my life miserable for almost three years.

I sincerely believe that Duke was using my health problems as a ploy to get rid of me. They steered me into their Employee Guidance Program and then manipulated me round and round, back and forth - they had me bouncing around in a "catch 22" situation.

On or about July 8, 1983, N. T. Lawing called me to report back to work on the following Monday, July 12. I did so. My fellow employees were very surprised. They had been told I was fired. I was still on Brewer's crew. J. R. Wilson then assigned me as a welder on loan to Avery Drake, a powerhouse mechanic foreman.

The work I was given was to weld construction hangers. I began by collecting my tools and some equipment to set up a "turntable," a work jig to facilitate welding hangers of the same size. No sooner did I return to the crew than I was told by Hershel's lead man Wayne Garvin that Ed ~~Seape~~ Scales, Drake's lead man, was already reporting to Brewer about me. He evidently told Brewer that I was "screwing off." It was then clear to me that I was being watched and that it would only be a matter of time before I was once again forced off the job and out of work.

I just resolved to keep my mouth shut and do the best job I

could on whatever I was given to do. That's what I did until I was fired. After a few days my co-workers accepted me, but my supervisors never let up on me. Even though I kept my mouth shut I still saw problems. For example, I previously described the practice of foremen overriding the craft workers who were trying to follow the correct procedures that dealt with construction hangers. Construction hangers were not necessarily safety related; however, the welding procedures for working on construction hangers were specified and depending on where they were installed they may be safety related.

Instead of the construction procedures being followed, however, I saw both Mr. Brewer and another supervisor, Mr. Fulgam overriding their employees in order to get the construction hangers finished. Foremen and workers were writing "VI ok" or "Vis OK" (meaning visually ok'd) on the hanger itself with a black pen. I do not know the exact location where the improperly fabricated hangers were installed, but I know that the fitters were working in Unit #2. One fitter told me the hangers were being used to support low pressure lines all over Unit 2 -- in the "dog house" and the reactor.

For another example, "Toot" Hackler, a welder on Mr. Fulgam's crew who worked with me, was a whole lot newer welder than myself and was trying to make a mark for himself. He would thrive on getting ten welds to my five. That did not matter to me because I was going to do five correctly; if he wanted to do ten incorrectly that was his business. Toot asked me to look at his work. Several

times I went over there with my welding gauge after he finished a weld that would call for a quarter of an inch weld and that had already been signed off. I would slide the gauge up, and it would not have a quarter inch weld on it, it would have 3/16ths or less, and sometimes it would have too much. (It is okay to overweld some, but it is not okay to underweld.) In addition I found porosity, undercut, arc-strikes, and all other rejectable weld problems.

I saw this happen many times over the past few months. I thought about bringing this to the attention of ~~my~~ supervisor but I knew he would just tell me to mind my own business.

In another case, a welder, D. A. Henry ("Buck"), was loaned over to a welder foreman on Number 1 side by the name of Tim Hollingsworth. It was a "Friday afternoon special." The welding machin e that Buck was using was defective. Many of the machines are in bad shape. This one did not have enough power to push a 1/8 rod. He had a welding job there on the table, a paperwork hanger, and it called for a partial penetration weld. The metal had to be ~~pressed~~ welded down as far as it could possibly go. About 3 o'clock he was out of the smaller 3/32 rods. He told Tim Hollingsworth that he was going out to the rod shack and pick up another pound of 3/32 rods, and Hollingsworth told him not to, that the job had to be done right away. He told him to go ahead and use the 1/8. Buck told him that the machine would not push a 1/8. As Buck told me, Tim said, "I am the foreman, and I'm telling you what to do, and you go ahead and use the 1/8." Well, Buck did the

best he could, and he made a mess out of it. Then, somebody over the weekend, a QC, QA man, I do not know who saw it, but somebody saw it, and Monday morning Buck was called on the carpet. He tried to explain his side of the story, but nobody wanted to listen. They pulled his stencil, took his qualification away from him, made him go back out to the test shack and retest. Had he not passed his test, he would have been demoted back to a helper, when all the while in my opinion Mr. Hollingsworth was the one to blame.

We had been told before: ~~quantity, not quality.~~ quality not quantity HSN 11.16.83 We had been told safety first, but neither was often the case. Every time construction needed to meet a deadline the construction procedures and safety got thrown out the window.

WELDING SYMBOLS

There had also been a problem with the inconsistency of Duke's welding symbols with the universal (AWS) welding symbols. This resulted in constant confusion, particularly for new welders who were trying to read the instructions on field blueprints. This could have resulted in many serious problems. One example, in September of this year in the Unit 2 Reactor, demonstrated that problem. I ~~ran into~~ worked with HSN 11.16.83 a crew of fitters who could not figure out how to correctly HSN 11.16.83 install a stiffener by reading the blueprints.

Although I am not an engineer, I know that there are seismic graphs done by computer and studies have been made on how much strain and stress something will take. ~~But if~~ Therefore, I believe HSN 11.16.83 the intention was to put a stiffener every foot apart with at least six inches of weld on each and ~~some~~ crew either could not read it or just for the sake of speed, followed a flawed procedure then there may be innumerable installation deficiencies. HSN 11.16.83

If the ~~fittees welded~~ stiffeners were installed #5N 11-16-83 according to their interpretation anyone could come along and kick it and it would break. The ~~other~~ proper #5N 11-16-83 way, a 20 pound hammer pounding all day would not break it.

In September I received another 16th occurrence.[2] This was because I missed work to respond to an urgent request from my doctor to check my Dilantin level. In fact, the check revealed that the dosage I had been taking since my seizure was 25% too low.

On October 3rd, although I started out for work, I was forced to return home due to nervous exhaustion and fatigue -- the degenerating work situation was getting the best of me. ~~This was my seventeenth occurrence.~~

On October 13 I was required to see my doctor again. On October 14 I returned to work. I was immediately told I was going to have to be removed from service, or suspended, for receiving the 18th occurrence. I refused to sign anything or to acknowledge the legality of Duke's "occurrence program." I told Duke officials that I believed my termination was a result of my having raised #5N 11-16-83 concerns over construction flaws, and harassment and intimidation I had been subjected to since then.

I also met with the NRC. I was told they would conduct an investigation into my allegations. Duke told me that they would conduct a 3 day investigation into my concerns. I was never contacted by any Duke official.

---

2. On June 17th, two days after I received my 16th occurrence, it dropped off.

The situation at work had not changed; although my co-workers sympathized with me for the pressure I was under, it was impossible for them to do anything. Many of them told me that they knew that Brewer and J. R. Wilson were determined to get rid of me. I have many friends at the Catawba plant, and if they can provide information, confidentially, to support what happened to me I believe that they will.

Although my experiences as a Duke employee at Catawba were extremely costly to me - personally, financially, and emotionally; HSN 11-16-83 HSN 11-16-83 really, I could not walk away from the problems I was aware of without trying to insure that something be done to correct them. That is why I contacted GAP.

The message came across to me loud and clear that Duke was trying to get rid of me. Sadly, they never understood that one, I was just trying to do an honest day's work for an honest day's pay, and two, that I was just trying to build Catawba as safely as I possible could. HSN 11-16-83

Howard Samuel Nunn

Howard Samuel Nunn

Signed and sworn to before me this 16th day of November, 1983.

Judy H. Patterson

Notary MCE 1-30-89

OFFICE OF PUBLIC AFFAIRS
REGION II - ATLANTA

NEWSPAPER: Charlotte Observer
DATE PUBLISHED: 11-27-83

LOCATED ON PAGE # 10
LOCATION ON PAGE: TOP HALF ___ BOTTOM HALF ___

Nuclear Plant Probed

Inquiries Reach Upper Levels

By JACK HORAN
Staff Writer

Until last April, the biggest news about the Catawba nuclear plant was that Duke Power Co. had moved the 1984 completion date of the plant ahead by five months.

Then the anti-nuclear Palmetto Alliance dropped a bombshell by disclosing complaints by Duke welding inspectors that question workmanship practices.

The two-year-old charges now have reached the highest levels of the Nuclear Regulatory Commission (NRC), which has four separate inquiries under way into incidents the Atlanta regional office finished investigating last February.

The safety-related charges already have been the focus of an NRC licensing hearing in a Rock Hill federal courtroom, proceedings due to enter their eighth week on Monday.

The usually low-key hearings have been marked by accusations that Duke Power Co. threatened retaliation against Catawba workers, secret testimony from three workers and, in one instance, accusations of cheating by welding inspectors on certification tests. The last came from an ex-inspector who walked into the hearings off the street.

At the core of the charges are the welding inspectors' complaints that supervisors pressured them to accept poor work, often voided inspection citations and ordered them to approve welds the workers found unacceptable.

Duke officials repeatedly have insisted their investigation showed procedural violations but no faulty welds. They denied harassing workers and blamed poor communications by managers for the problems rather than any intent to shortcut safety.

"There's an enormous amount of smoke out there," said an NRC official in Bethesda, Md., last week. He asked not to be identified. "It's premature to say if there's a forest fire out there."

To determine whether Catawba is engulfed in meaningless smoke or serious flames, the NRC has been forced to launch three other investigations into Catawba.

Moving along in parallel with the licensing proceedings are:

- An Office of Investigations (OI) probe into possible mishandling of welding inspectors' complaints in violation of federal rules.
- An Inspection and Enforcement (I&E) division inquiry into an activist group's petition asking for the agency to do a "vertical slice" of Catawba's safety systems, basically an independent spot-check.
- An Office of Inspector and Auditor (OIA) internal probe into whether regional NRC inspectors improperly turned over draft review documents to Duke officials and compromised the confidentiality of workers who complained to the NRC.

"We don't feel the allegations have substance," NRC spokesman Ken Clark in the Atlanta regional office said of the latter charges.

The NRC investigations — which have found nothing wrong at Catawba so far — ironically are aimed at a plant built by one of the most proficient utilities in the nation. Duke is highly regarded as one of the most competent nuclear operators not only by the industry but by the NRC itself.

Asked if the fact Duke is the target of workmanship investigations surprises NRC officials, the official replied: "Not yet, but it damn well will if several of these allegations register a cause of concern."

Others, however, see the pattern as similar to that found at the Zimmer nuclear plant at Ohio and others, where falsification and workmanship problems have been uncovered.

Billie Garde: "The implications at Catawba are really serious. What happened at Catawba has not been tolerated at other plants ... at which case Catawba has a mess on its hands."

The impetus for the investigations didn't come from the NRC but from an aggressive Washington-based group aimed at helping insiders in government and industry who want to blow the whistle on internal problems.

That group is the Government Accountability Project. The prime mover behind the Catawba investigations is Billie Garde, a project director who has almost singlehandedly pushed the issue, soliciting workers with safety concerns, pressing NRC officials to assure their confidentiality and lobbying congressional committees for action.

"This is the first time in which an OI investigation is the subject of an NRC licensing board (proceeding)," Garde said. "It's absolutely unique."

Garde sees Catawba as another Zimmer, where the NRC halted work last November after her group prodded the agency to investigate. Last week, the NRC refused to let work resume at the $1.6-billion Zimmer plant, like Catawba's Unit No. 1, already 97% complete.

COMMENTS:

"The implications at Catawba are really serious. What happened at Catawba has not been iterated at other plants ... at which case Catawba has a mess on its hands," she said.

None of 31 Catawba welding inspectors who submitted written testimony to the hearings say they know of any defective welds. In essence they say it was their vigilance and documentation — they kept detailed notes — that kept the plant safe.

Two former workers, Nolan Hoopingarner and Ron McAfee, testified for the Palmetto Alliance that they observed shoddy workmanship. Both Duke and NRC officials counter that the men either misinterpreted what they saw or that Duke fixed safety-related problems they saw, such as the flooding of two emergency generators during a 1979 rainstorm.

But Catawba opponents take a broader view of the incidents, arguing procedural violations uncovered in the quality assurance program suggest a tip-of-an-iceberg potential for widespread flaws.

That's basically what the NRC must resolve in inquiries that may well stretch beyond May 1984, the month that Duke says Catawba Unit No. 1 will be ready for loading and startup testing. $3.9-billion, two-unit plant is iles southwest of downtown lotte in York County, S.C.

'ou're talking in terms of hs," said an investigator in Office of Investigations. h reports directly to the five commissioners.

I&E investigators are gath- g information to act on e's September petition for a "vertical slice" inspection.

"What she's saying is there is too much doubt," said Robert Heishman, branch chief for reactor construction programs. Whether I&E will order an inspection will depend on whether there are "enough questions there that we have to go back and do something," he said.

The seven-month internal probe by OIA is "still going on. When it's going to be completed, I don't know," NRC spokesman Frank Ingram said last week.

Meanwhile, Duke is conducting preliminary tests and finishing work on piping supports at Catawba, according to spokeswoman Mary Cartwright.

Cartwright said Duke doesn't know whether the investigations will hold up Catawba's license.

OFFICIAL USE ONLY

MEMORANDUM TO CASE FILE

TYPE ACTION
( ) RECORD OF CONVERSATION
( ) CASE REVIEW / STATUS
( ) OTHER

PARTICIPANTS

CONFIDENTIALITY REQUESTED YES NO

FILE NO.

DATE

TIME

SUMMARY

= NON-DISCLOSURE AFFIDAVIT =

11.14.83 B. Urye

11.15.83 N. Economos

11.16.83 G. TODD

11.16.83 P. RUTLEDGE (for GAP at the request of B. Garde)

11.18.83 J.P. O'REILLY

11.28.83 J. LANKFORD

11.28.83 W. TOBIN

12.01.83 R. MARTIN (only advised of name of ALGR)

12.01.83 J. PUCKETT (only advised of name of ALGR)

11.28.83 T. PEEBLES

11.28.83 J. LENAHAN

12.05.83 D. FREDRIKSON

12.06.83 A. HERDT

12.06.83 J. OLSHINSKI

T. CONLON

01.03.84 J. HARRIS

01.09.84 A. TILLMAN

01.11.84 P. SKINNER

01.17.84 ELAINE SHERMAN

01.17.84 LESLIE L. DANIEL

01.18.84 GLORIA REID

01.18.84 LINDA SLACK

01.19.84 Judy COLEMAN

01.19.84 Hollis TURNER

01.19.84 Helen MALLET

01.19.84 ALICE WOODLEY

02.07.84 Roger Goode

02.07.84 T. Harrison

PAGE OF

PREPARED BY

DATE

ACTION REQUIRED

REVIEWED BY

DATE

OFFICIAL USE ONLY — DO NOT DISCLOSE

FORM SEC-T12 Rev. 8

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Hellen E Malett

Subscribed and sworn to before me
this 19th day of January 1983.

Elizabeth A Gaines
Notary Public

[illegible] c. Georgia, State at Large
[illegible] Expires Sept. [illegible]

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Alice D. Woodley

Subscribed and sworn to before me
this 19th day of January 1983.4

Elizabeth B. Gaines
Notary Public

Notary Public, District of Columbia at Large
My Commission Expires Sept. 17, 1984

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Judy C. Coleman

Subscribed and sworn to before me

this 18th day of January 1983.

Elizabeth B Gaines

Notary Public

Notary Public, District of Columbia
My Commission Expires Sept. 17, 1984

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Mr. Hall A. Jones

Subscribed and sworn to before me
this 19th day of January 1984.

Elizabeth B. Gaines
Notary Public

Notary Public, Georgia, State at Large
My Commission Expires Sept. 17, 1984

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Subscribed and sworn to before me
this 11th day of Jan 1983.

Notary Public

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Subscribed and sworn to before me
this 11th day of Jan 1983.

Notary Public

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Linda M. Slack

Subscribed and sworn to before me

this 19th day of January 1983.4

Notary Public

Notary Public, Georgia, State at Large
My Commission Expires Sept. 17, 1984

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until furthe order of the Board.

Diana A. Reid

Subscribed and sworn to before me
this 11th day of February 1983.

Elizabeth D Gray
Notary Public

Notary [illegible]
My Commission [illegible]

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Leslie L. Daniels

Subscribed and sworn to before me
this 17th day of January 1984.

Elizabeth A. Gaines
Notary Public

My Commission Expires Sept. 17, 1984

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Edward Inman

Subscribed and sworn to before me
this 17th day of January 1984.

Elizabeth S. Gainis
Notary Public

Notary Public, Georgia, State at Large
My Commission Expires Sept. 17, 1984

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Aubrey Pilmore

Subscribed and sworn to before me

this 9th day of January 1983.4

Elizabeth D Daniel

Notary Public

Notary Public, Georgia, State at Large
My Commission Expires Sept 17, 1984

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

John R. Harris

Subscribed and sworn to before me
this 3rd day of January 1984

Violet B. Hord
Notary Public

Notary Public, Georgia State at Large
My Commission Expires June 8, 1984

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Joel a. Olshinski

Subscribed and sworn to before me
this 6th day of December 1983.

Elizabeth D. Gaines
Notary Public

Notary Public, Georgia, State at Large
My Commission [illegible] 1984

JA OLSHINSKI

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Allan R. Hull

Subscribed and sworn to before me
this 6th day of December 1983.

Elizabeth L Haines
Notary Public

Notary Public, Georgia, State at Large
My Commission Expires Sept 17, 1984

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Paul R. Tridrikson

Subscribed and sworn to before me
this 5th day of December 1983.

Elizabeth A Gaines
Notary Public

Notary Public, District of Columbia
My Commission expires Sept. 17, 1984

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Joseph J. Levin

Subscribed and sworn to before me
this 28th day of November 1983.

Elizabeth B. Gaines
Notary Public

Notary P[illegible]
My Commi[illegible] Sept 17, 198[illegible]

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Thomas A Peebles

Subscribed and sworn to before me
this 28TH day of November 1983.

Elizabeth A. Gaines
Notary Public

Notary Public, Georgia, State at Large
My Commission Expires Sept. 17, 1984

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Robert D Martin

Subscribed and sworn to before me
this 1ST day of December 1983.

Elizabeth D. Gaines
Notary Public

Notary Public, Georgia, State at Large
My Commission Expires Sept. 17, 1984

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

John M Puckett

Subscribed and sworn to before me this 1ST day of December 1983.

Elizabeth D. Gaines
Notary Public

Notary Public, Georgia, State at Large
My Commission Expires Sept. 17, 1984

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Subscribed and sworn to before me
this 28th day of November 1983.

Notary Public

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finisnec using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protectec information for safekeeping until further order of the Board.

Jeffrey B. Lanford

Subscribed and sworn to before me
this 28th day of November 1983.

Notary Public

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

K Gaines

Subscribed and sworn to before me
this 14 day of November 1983.

Elizabeth S. Gaines
Notary Public

Notary Public, Georgia, State at Large
My Commission Expires Sept 17, 1984

AFFIDAVIT OF NON-DISCLOSURE

I, GREGORY A. TODD, being duly sworn, state:

1. As used in this Affidavit of Non-Disclosure,

(a) "protected information" is (1) information revealed in connection with in camera hearings in the Catawba operating license proceeding, including particularly the names of and identifying facts about in camera witnesses, and any other related information, particularly documents, specifically designated by the Licensing Board; or (2) any information obtained by virtue of these proceedings which is not otherwise a matter of public record and which deals with the in camera hearings.

(b) An "authorized person" is a person who, at the invitation of the Atomic Safety and Licensing Board ("Licensing Board"), has executed a copy of this Affidavit.

2. I shall not disclose protected information to anyone except an authorized person, unless that information has previously been disclosed in the public record of this proceeding. I will safeguard protected information in written form (including any portions of transcripts of in camera hearings, filed testimony or any other documents that contain such information), so that it remains at all times under the control of an authorized person and is not disclosed to anyone else.

3. I will not reproduce any protected information by any means without the Licensing Board's express approval or direction. So long as I possess protected information, I shall continue to take these

precautions until further order of the Licensing Board.

4. I shall similarly safeguard and hold in confidence any data, notes, or copies of protected information and all other papers which contain any protected information by means of the following:

(a) My use of the protected information will be made at a place approved by the Board.

(b) I will keep and safeguard all such material in a locked facility approved by the Board.

(c) Any secretarial work performed at my request or under my supervision will be performed at the above location by one secretary of my designation. I shall furnish the Board and parties an appropriate resume of the secretary's background and experience.

(d) All mailings by me involving protected information shall be made by me directly to the United States Postal Service or by personal delivery.

5. If I prepare papers containing protected information in order to participate in further proceedings in this case, I will assure that any secretary or other individual who must receive protected information in order to help me prepare those papers has executed an affidavit like this one and has agreed to abide by its terms. Copies of any such affidavit will be filled with and accepted by the Licensing Board before I reveal any protected information to any such person.

6. I shall use protected information only for the purpose of preparation, including any investigations which may be necessary, for

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Subscribed and sworn to before me
this 14 day of November 1983.

Elizabeth A. Gaines
Notary Public

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Subscribed and sworn to before me

this 7th day of February 1983.4

Elizabeth A. Grimes

Notary Public

Notary P... - State of Maryland
My Commi... 12, 19...

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

Thomas S. Hamm

Subscribed and sworn to before me
this 7th day of February 1983.4

Elizabeth S. Gaines
Notary Public

Notary Public, [illegible]
My Commission [illegible] Oct. 17, 1984

AFFIDAVIT OF NON-DISCLOSURE

I, JAMES P. O'REILLY, being duly sworn, state:

1. As used in this Affidavit of Non-Disclosure,

(a) "protected information" is (1) information revealed in connection with in camera hearings in the Catawba operating license proceeding, including particularly the names of and identifying facts about in camera witnesses, and any other related information, particularly documents, specifically designated by the Licensing Board; or (2) any information obtained by virtue of these proceedings which is not otherwise a matter of public record and which deals with the in camera hearings.

(b) An "authorized person" is a person who, at the invitation of the Atomic Safety and Licensing Board ("Licensing Board"), has executed a copy of this Affidavit.

2. I shall not disclose protected information to anyone except an authorized person, unless that information has previously been disclosed in the public record of this proceeding. I will safeguard protected information in written form (including any portions of transcripts of in camera hearings, filed testimony or any other documents that contain such information), so that it remains at all times under the control of an authorized person and is not disclosed to anyone else.

3. I will not reproduce any protected information by any means without the Licensing Board's express approval or direction. So long as I possess protected information, I shall continue to take these

precautions until further order of the Licensing Board.

4. I shall similarly safeguard and hold in confidence any data, notes, or copies of protected information and all other pap contain any protected information by means of the following.

(a) My use of the protected information will be made at a place approved by the Board.

(b) I will keep and safeguard all such material in a locked facility approved by the Board.

(c) Any secretarial work performed at my request or under my supervision will be performed at the above location by one secretary of my designation. I shall furnish the Board and parties an appropriate resume of the secretary's background and experience.

(d) All mailings by me involving protected information shall be made by me directly to the United States Postal Service or by personal delivery.

5. If I prepare papers containing protected information in order to participate in further proceedings in this case, I will assure that any secretary or other individual who must receive protected information in order to help me prepare those papers has executed an affidavit like this one and has agreed to abide by its terms. Copies of any such affidavit will be filled with and accepted by the Licensing Board before I reveal any protected information to any such person.

6. I shall use protected information only for the purpose of preparation, including any investigations which may be necessary, for

this proceeding or any further proceedings in this case dealing with quality assurance and quality control issues, and for no other purpose.

7. I will avoid disclosure of protected information to the best of my ability. However, it must be recognized that in the course of conducting investigations in connection with this proceeding, certain protected information may be independently discerned incident to that investigation which might result in the inadvertent disclosure of protected information.

8. I shall keep a record of all protected information in my possession, including any copies of that information made by or for me. At the conclusion of this proceeding, I shall account to the Licensing Board or to a Commission employee designated by that Board for all the papers or other materials containing protected information in my possession and deliver them as provided herein. When I have finished using the protected information they contain, but in no event later than the conclusion of this proceeding, I shall deliver those papers and materials to the Licensing Board (or to a Commission employee designated by the Board), together with all notes and data which contain protected information for safekeeping until further order of the Board.

James P. O'Reilly

Subscribed and sworn to before me
this 18th day of November 1983.

Elizabeth A. Grimes
Notary Public

Notary [illegible]
My Commission Expires Sept. 17, 1986

b. Base liner plate and formed embedded anchors.

c. Penetration reinforcement plates and sleeves.

d. Plate and penetration sleeve weld preparation.

e. Shop welding.

f. Leak chase channels and/or angles that require being rolled to a specified radius as shown on the drawings.

4.1.2 The following will be furnished by others:

a. Erection.

b. Anchor bolts and sleeves embedded in concrete.

c. Leak chase channels, except as noted in 4.1.1(f).

d. Field unloading and storage.

e. Field welding.

f. Field painting.

g. Personnel locks and equipment hatch.

h. Foundation pads for equipment as shown on drawing CN-1042-4.

5. GENERAL DESIGN AND MATERIAL REQUIREMENTS

5.1 GENERAL

5.1.1 The design drawings indicate the extent and general arrangement of work. If any departures from these drawings and/or Specification are deemed necessary, detailed drawings of such departures and the reasons therefor shall be submitted to the Owner for approval. No such departures shall be made without prior approval.

5.1.2 Materials covered by this Specification are subject to the referenced attachments to these technical provisions. The Contractor shall be responsible for and shall be governed by all requirements therein.

5.2 MATERIALS

5.2.1 Materials shall meet the following specifications:

a. Steel plate for Containment Vessel, including the base liner plate, shell plate, and ring stiffeners, shall be SA-516, Grade 70. In addition, it shall also meet the material requirements 1

of Subsection NE of ASME Boiler and Pressure Vessel Code, Section III. The vertical stiffeners shall be ASME SA-36 Mod. flat bar. | 1

b. ~~Pipe penetration sleeves shall be seamless SA-333, Grade 6 and/or SA-516, Grade 60. Penetration sleeves furnished by the Contractor do not attach to Class 1 or Class 2 process systems.~~ The material shall meet the requirements of Subsection NE of ASME Boiler and Pressure Vessel Code, Section III. | 1, 3

c. Shapes for the base liner plate shall be ASME SA-36, including the channel at El. 550+0.

d. Leak chase channels for the knuckle plate shall be SA-479, Type 304, and shall meet material requirements of Subsection NE of ASME Boiler and Pressure Vessel Code, Section III. Angles and channels other than the knuckle plate shall be SA-36. | 1

e. All material, except the base liner plate and its embedments, shall meet the impact requirements of Paragraph NE-2350 "Charpy V-Notch Tests", at or below -20°F for a service metal temperature of +10°F. | 1,5,6

f. Embedded plates used to transfer loads through the thickness of the plate, as noted on drawing CN-1042-4, shall be ultrasonically examined and repaired in accordance with Paragraph NB-2500 of Section III of the ASME Code. | 1

No parts , materials or equipment shall be of manufacture outside the United States without prior approval of Owner.

5.3 FABRICATION

5.3.1 The Containment Vessel shell plate and accessory steel shall be fabricated in accordance with the requirements of Subsection NE, "Class MC Components" of ASME Boiler and Pressure Vessel Code, Section III, "Nuclear Power Plant Components." Accessory steel shall be defined as all permanent attachments to the Containment Vessel excluding the base liner plates and its embedments. An "N" Code Stamp is not required on the products furnished. | 1, 3

The final dimensions of the cylindrical plates shall meet the tolerances shown on the drawings. Plate length and width tolerance shall be ± 1/16" and plate diagonal measurements shall be ± 3/32". Above measurements are to be taken with plate flat prior to rolling. Diagonal measurement is to insure a true rectangular plate with stated tolerances.

Fabrication tolerances for the dome plate are to be specified on the shop drawings by the Contractor and shall be approved by the Owner.

The diagonals of the dome plates shall be equal within a maximum difference of 3/16". | 3, 4

The weld detail used for the penetration sleeve to the shell plate or reinforcement plate weld shall be in accordance with Detail "g" or "h", Figure NE-3359.1(c)-1 of Subsection NE of the ASME Code. The fillet weld as defined by t_c shall be provided on both sides of the weld.

Fabrication shall be in accordance with approved Shop Drawings.

Plate weld preparation shall be as shown on the drawings.

Bevel preparations shall be by mechanical means or flame or arc cutting as approved by the Owner. | 3

5.4 WELDING

5.4.1 All welding shall be done only by welders qualified with the actual essential variables employed in accordance with Part A, Section IX, ASME Code. All welding procedures shall be qualified under provisions of Part A, Section IX, ASME Code and shall also meet the ASME Code requirements for ductility. Welding procedures and procedure qualification test results shall be submitted to the Owner for approval before welding is started. Performance qualification test results for each welder and welding operator shall be made available for Owner's review and approval. | 3

5.4.2 All welds shall be full penetration groove welds unless otherwise approved by the Owner. Welding procedure identifications or designations shall be shown on the Contractor's drawings for each weld.

5.4.3 Prior to welding operations, the Contractor shall submit to the Owner for approval three (3) copies of each of the following:

5.4.3.1 The qualified welding procedure specification.

5.4.3.2 The report of the welding procedure qualifications for each type weld.

The Owner shall require any welder or welding operator to repeat any qualification tests when, in his opinion, the work indicates a reasonable doubt of the welder's or welding operator's competance and proficiency. | 3

5.4.4 All surfaces to be welded shall be free from protective coatings, and from scale, rust, and grease for a distance of two inches back from the edge of the welding zone, and shall be carefully inspected after completion of edge preparation for laminations, shear cracks, or other injurious defects. Permissible repairs, as approved by the Owner shall be inspected by X-ray, ultrasonic, or magnetic particle methods as directed by the Owner. Material not designated as reparable by the Owner shall be replaced.

5.4.5 Each layer of weld shall be thoroughly cleaned and the slag removed before subsequent layers are deposited. Upon completion, each weld shall be thoroughly cleaned and wire brushed, and extraneous nodules of weld metal and crust removed by chipping or other adequate means.

5.4.6 The back side of all welding grooves shall be arc gouged, back chipped or ground to sound and clean metal. | 3

5.4.7 In shielded metal arc welding the electrodes shall be of the low hydrogen type. All welding filler metal shall have mechanical properties which are similar to the base metal and meet ASME specifications.

5.4.8 All shell plates that include penetration sleeves shall be post-weld heat treated in accordance with Subsection NE, Section III of the ASME Code. | 1

5.5 PREPARATION FOR SHIPMENT

5.5.1 The finished components shall be shipped in a manner to assure safe arrival at the site.

5.5.2 All weld preparation, flanged faces, other machined surfaces and protruding parts shall be adequately protected against accidental damage and corrosion during transit. Shipping damage shall be repaired at the Contractor's expense.

5.5.3 The Contractor shall complete the attached Form 301.4 for each shipment and obtain Owner's approval prior to shipment.

6. SPECIAL REQUIREMENTS

All metal components shall be stamped with both the heat number and piece mark using a low-stress metal stamp. Containment shell plate stampings shall be on the lower right-hand corner of the outside face of the plate.

At the Contractor's option, the Quality Control identification numbers may be stamped on the plates in lieu of the heat numbers as long as those Q.C. numbers are traceable to heat numbers and associated Mill Test Reports. | 1

7. QUALITY ASSURANCE REQUIREMENTS AND DOCUMENTATION

7.1 QUALITY ASSURANCE

These Specifications cover structures and materials important to nuclear safety; and it is essential that they meet the quality standards of these specifications and referenced codes, standards and guides; and that this quality be proven by full documentation. With the proposal, each Bidder shall submit a description of the quality assurance procedures he proposes to use;

3.8.2 STEEL CONTAINMENT

3.8.2.1 Description of the Containment

The containment vessel is a freestanding welded steel structure consisting of a vertical cylinder with a hemispherical dome and a flat circular base. The cylinder is stiffened by circumferential ring girders and vertical stringers welded to the exterior of the vessel. The containment shell is anchored to the Reactor Building foundation by means of anchor bolts around the perimeter of the cylinder base. The flat base of the containment is a 1/4 in. liner plate encased in concrete and anchored to the Reactor Building foundation. The base liner plate functions only as a leak-tight membrane and is not designed for structural capabilities. The containment vessel has a diameter of 115 ft and overall height of 171 ft 3 in. Further details of the containment geometry and Reactor Building general arrangements are shown in Figures 3.8.1-1 and 1.2.2-8 through 1.2.2-16. Additional containment vessel details, including plate thicknesses and vertical and circumferential stiffener locations, are shown in Figures 3.8.2-1, 3.8.2-4 and 3.8.2-5. Containment vessel anchorage details are shown in Figure 3.8.1-5.

Several penetrations are required through the containment vessel for personnel and equipment access, fuel transfer and various piping systems. The containment penetrations are:

(1) EQUIPMENT HATCH

The equipment hatch is composed of a 20 foot cylindrical sleeve in the containment shell and a dished head with mating, bolted flanges. The flanged joint has double compressible seals with an annular space for pressurization and testing.

The equipment hatch is designed, fabricated and tested in accordance with Section III, Subsection NE, of the ASME Boiler and Pressure Vessel Code.

Details of the equipment hatch are shown on Figure 3.8.2-2.

(2) PERSONNEL LOCKS

Two personnel locks are provided for each unit. Each lock consists of a cylindrical sleeve with a bulkhead at each end. Each bulkhead has double gasketed doors with an interlocking system to prevent both doors from being opened simultaneously. Instrumentation is provided to indicate the position of each door. Double, inflatable seals are provided on each door. Automatic leak testing equipment is piped to the annular space between seals for periodic testing as required by the Technical Specifications. The use of double inflatable seals allows testing of the annular space without the use of external strong-backs or other remote devices.

The personnel locks are designed, fabricated, tested and stamped in accordance with Section III, Subsection NE of the 1971 ASME Code, including all addenda up to the Summer of 1972. The personnel locks are installed as a unit with accompanying reinforcing collars. Details of the personnel locks are shown on Figure 3.8.2-2.

Basis Accident. Existing test data and analysis on electrical penetration types may be used for this verification if the particular environmental conditions of the test are equal to or exceed those for Catawba.

(8) MECHANICAL PENETRATIONS

Typical mechanical penetrations are shown on Figure 3.8.2-3.

Mechanical penetration functional requirements, code considerations, analysis and design criteria are defined in Section 3.9.

A comprehensive list of all penetrations is given in Figure 3.8.2-6.

3.8.2.2 Applicable Codes, Standards and Specifications

The containment vessel is designed, fabricated, constructed and tested in accordance with Subsection NE, Section III, of the ASME Boiler and Pressure Vessel Code, 1971 Edition, including all addenda through the Summer of 1972

Subsection NE, Section III, does not make provisions for stamping pressure vessels of this geometry, and therefore the containment vessel has not received an ASME Code Stamp. The shop fabrication, field erection, nondestructive testing, pressure testing and quality assurance documentation are in accordance with the ASME Code.

Regulatory Guide 1.19 is used for nondestructive testing of the Containment bottom liner with the following additions or exceptions:

a. C.1.b - Add liquid penetrant method as an acceptable means of testing liner seal welds.

   Liquid penetrant is used more successfully in detecting circular defects.

b. Delete C.1.c.

   Non-destructive testing as required in C.1.b and leak chase pressure testing to peak containment pressure as required in C.1.d have been successful in detecting leaks in seal welds. Vacuum box tests run at five psi do not necessarily detect leaks that might occur at peak containment pressure.

   In addition to the pressure test required in C.1.d an additional ten minute peak containment pressure leak chase pressure test is performed prior to and after placing concrete over the leak chase system. These tests are performed to detect leaks created during construction activities after the completion of the initial leak chase pressure test and during placing of concrete around the chase system.

c. In C.1.d where leak chase system channels are installed over liner welds, the system is tested for leak tightness by pressurizing to peak containment pressure. If any leak is indicated in a 30-minute period, the leak is repaired and the system retested.

The material, fabrication (except for weld details) and allowable stresses for the transition torus meet the requirements of Subsection NE, Section III of the ASME Code, 1971 Edition including all addenda through the Summer of 1972.

The welds and test channels on the torus are as shown in Figure 3.8.2-7. The torus is considered part of the bottom liner plate and all welds are tested as specified in Section 3.8.2.7.

[redacted] liner plates are ultrasonically tested in accordance with Subparagraph NB-2532.1 of Section III of the ASME Code to insure that there are no laminations that could result in a failure to transmit loads normal to the liner plate such as would occur in the region of B-series Cadweld Splices.

3.8.2.3 Loads and Loading Combinations

The containment vessel steel shell is designed for the following loads:

a. Dead loads and construction loads.
b. Thermal loads.
c. Seismic loads.
d. External pressure.
e. Design basis accident.
f. Localized loads.

Dead Load and Construction Loads

The dead load includes the weight of the containment shell and all permanent attachments. Construction loads include all loads imposed on the containment shell during construction.

Thermal Loads

The containment shell is subject to thermal loads during normal operation of the unit. The operating temperatures are between 75°F and 110°F in the upper containment compartment and between 80°F and 120°F in the lower containment compartment.

Seismic Loads

The seismic loads are derived from horizontal and vertical ground response spectra. The horizontal ground motion is represented by OBE (.08g) and SSE (.15g) spectra. The spectrum used for the vertical direction is equal to two-thirds of the horizontal spectrum. The ground motions are taken to act in one of two perpendicular horizontal directions simultaneously with the vertical direction. For further details on seismic loads see Section 3.7, "Seismic Design."

[redacted]

The external pressure load is due to the internal vacuum created by an accidental trip of a portion of the Containment Spray System during normal unit operation. T[redacted]g. For details of the design vacuum pressure conditions refer to Section 7.6.

[redacted]

Loads for the Design Basis Accident are the result of a rupture in the primary coolant system up to and including a double-ended rupture of the largest pipe or a main steam line break. The following loads are associated with the DBA:

(1) [redacted]. This pressure is applied as a static load case.

(2) The containment shell must also be designed for the short-term pressure transient immediately following a LOCA or MSL break. This is a dynamic load of an asymmetric nature (i.e., the pressure varies around the circumference of the shell) due to the geometric layout of an ice condenser containment.

(3) The containment atmosphere temperatures after a LOCA or MSL break are described in Section 6.2.1.

(4) The containment shell experiences hydrostatic loads at the base due to post-LOCA flooding.

See Chapter 6 for further details of the Containment Design Basis Accident.

Localized Loads

Penetration loads, piping loads and jet impingement loads are all localized loads applied to the containment vessel. Penetration and piping loads are due to dead load or pipe reactions at penetrations and pipe supports welded to the shell. Jet impingement loads are due to high pressure fluid jets caused by the rupture of small diameter piping adjacent to the containment vessel.

Load Combinations

The loads applied to the containment vessel are combined in accordance with procedures given in the Standard Review Plan (see Reference 5). These combinations are summarized in Table 3.8.2-1. The nomenclature used in this table is defined in Table 3.8.1-2.

3.8.2.4 Design and Analysis Procedures

The containment shell is designed based on the loads and loading combinations of Section 3.8.2.3 using the codes, standards and specficiations defined in Section 3.8.2.2.

3.8.2.4.1 Design Bases

The containment vessel is designed to assure that an acceptable upper limit of leakage of radioactive material is not to be exceeded under design basis accident conditions.

The containment vessel utilizes the ice condenser concept for energy absorption during a loss-of-coolant accident. This rapid energy absorption capability maintains the containment vessel design pressure at a low level as well as reducing the peak duration. See Section 6.7 for details and description of the ice condenser design and function.

The use of the ice condenser requires that the containment vessel be divided into three major volumes. The lower volume houses the Reactor Coolant System, the intermediate volume houses the ice condenser energy absorption system, and the upper volume contains the air after passing from the lower volume through the ice condenser. Compartments have been designed for peak differential pressures due to a severance of the largest pipe within the enclosure or flow into the compartment from a break in an adjacent compartment.

The containment vessel is designed to accommodate all calculated external pressures. Vacuum breakers are not required.

The containment shell plate (cylinder and dome) is not exposed to ground water and is protected by the Reactor Building.

The containment bottom liner plate is anchored to the Reactor Building foundation which is constructed of reinforced concrete with waterstop in all construction joints. No waterproofing is provided.

The containment bottom liner plate is designed to function as a leak-tight membrane and is not required to function as a structural component. The liner plate is 1/4 inch thick carbon steel with the total thickness available for corrosion allowance. Liner plate details are shown on Figure 3.8.2-7.

3.8.2.4.2 Design Per ASME Code

The containment vessel is designed to satisfy the requirements of the ASME Code, paragraphs NE-3133 and NE-3324. These sections of the code describe the procedures to be followed in sizing the various parts of the containment shell under external pressure loading and internal pressure loading, respectively.

The localized areas around large and small openings of the containment vessel are analyzed and designed to meet the requirements of paragraph NE-3330 of the ASME Code. A systematic numerical procedure is set up in order to analyze small penetration reinforcement in accordance with the ASME Code requirements. The numerical procedure provides detailed requirements for reinforcing the shell around an opening. Separate analysis and design are performed on the equipment hatch and personnel air lock penetrations.

3.8.2.4.3 Static and Seismic Load Analysis

The containment vessel is analyzed to determine all membrane forces, moments and shears as a result of all specified static and seismic loadings. The vessel is idealized as a thin shell of revolution. The stresses and deflections produced in the shell under the applied loads are calculated by a computer program written by Professor A. Kalnins of Lehigh University (Reference 1). The computer mathematical model used to represent the containment shell is shown in Figure 3.8.2-9. See Section 3.7.2 for further details of the seismic analysis.

3.8.2.4.4 Analysis of Local Areas

The overall analysis of the containment vessel as described in Section 3.8.2.4.3 does not examine localized stresses around the equipment hatch and personnel locks since these large penetrations cannot be accurately represented in an axisymmetric model. A more detailed analysis of this region of the shell is required. A three-dimensional finite element model of the containment was analyzed using the STARDYNE computer code to obtain results around the equipment hatch and airlocks (see Reference 3). The finite element model used for this analysis is shown in Figure 3.8.2-10.

Concentrated forces and moments are applied locally to the containment vessel by welded attachments, penetrations and jet impingement. These loads are analyzed as equivalent static loads using finite element models with the STRUDL computer code (see Reference 4). The stresses resulting from the localized loads are combined with the general membrane stresses to determine the total stress state in the shell.

3.8.2.4.5 Analysis of Design Basis Accident

The loadings on the containment vessel due to the design Basis Accident are described in Section 3.8.2.3. All of the loads except the short term pressure transient are considered as static loads and are analyzed as described in Section 3.8.2.4.3. The stress resultants and displacements of the containment shell due to an asymmetric transient dynamic pressure associated with a loss-of-coolant accident are determined by performing a dynamic analysis as follows:

1. Design Considerations:

   The rapid energy absorption capability of the containment, due to the use of the ice condenser concept, maintains the containment vessel design pressure at a low level as well as reducing the peak pressure duration. This reduction in peak pressure results in a shell thickness below the stress-relieving requirements of the ASME Boiler and Pressure Vessel Code.

2. Loss-Of-Coolant Accident:

   A LOCA is a hypothetical double-ended rupture of a reactor coolant pipe in which the pressurized water flashes immediately into steam causing a pressure transient build-up in the containment compartments.

A time history of dynamic forces at each node is developed for each specified break location. Since the load varies around the circumference, it is resolved into Fourier components. Both symmetrical and asymmetrical terms are used in the final Fourier representation of the pressure transient. Thirteen Fourier components (6 sin, 6 cos, 1 constant) were employed in the representation since convergence was found satisfactory. A typical comparison of the actual pressure distribution for a given time step is shown in Figure 3.8.2-16.

3.8.2.4.6 Buckling Analysis

The stability analysis of the containment vessel is performed by the methods defined in Code Case N-284 of the ASME Code (see Reference 6). The buckling capacity of the shell is based on linear bifurcation (classical) analysis. Capacity reduction factors are applied to account for the effects of imperfections and nonlinearity in geometry and boundary conditions. Plasticity reduction factors are applied to account for nonlinearity in material properties if elastic limits are reached. Overall stability, panel buckling and stiffener buckling are evaluated using bifurcation analysis of an axisymmetric shell of revolution with the BOSOR 4 computer code (see Reference 7). Local buckling capacity of the region surrounding the equipment hatch and personnel lock is based on a bifurcation analysis of a three-dimensional finite element model with the NASTRAN computer code (see Reference 8). The BOSOR and NASTRAN computer mathematical models used for the bucking analysis are shown in Figures 3.8.2-17 and 3.8.2-18, respectively. The containment vessel buckling capacity is evaluated for the load combinations defined in Table 3.8.2-1 as well as the transient dynamic pressure load due to LOCA.

3.8.2.4.7 Ultimate Capacity Analysis

The ultimate capacity of the containment vessel due to overpressurization is evaluated by a large displacement elastic-plastic analysis. The containment vessel is represented by an axisymmetric shell finite element model with the MARC computer code (see Reference 9). Actual material properties based on a statistical analysis of mill test reports are used in determining the stress-strain curve for input to the MARC program. The material properties obtained from the statistical analysis are listed in Table 3.8.2-8. Figure 3.8.2-19 shows the finite element model used for this analysis. The criteria used in determining the collapse load is given in the 1980 ASME Code, Section III, Appendix II, Article 1430. The ultimate capacity of localized areas such as the equipment hatch, personnel lock and other penetrations is also evaluated.

3.8.2.4.8 Computer Program Description

(1) Kalnin's shell program (Reference 1) uses the finite difference method to solve the differential equations for a thin shell of revolution derived by E. Reissner (Reference 10). The equations are based on the linear theory of elasticity and consider both membrane and bending action in the shell. This method of analysis (Reference 11) has been widely used in the analysis of thin axisymmetric shells.

safety for overall stability and local buckling for the critical load combinations are shown in Table 3.8.2-7. The results presented in this table show that the containment vessel has a buckling factor of safety greater than 3.0 for normal loads and a minimum factor of safety of 2.0 for all cases involving the Design Basis Accident.

Q220.41

3.8.2.5.3 Containment Ultimate Capacity

The containment vessel has been analyzed to determine the maximum internal pressure to which it can be subjected without failure. Based upon linear elastic analysis, the requirements of the ASME Code, Division 1, paragraph NE-3220, Service Level C Limit, are met for a combination of dead load and an internal pressure of 45 psig. Based upon nonlinear analysis, the lower bound for the containment ultimate capacity is calculated to be 72 psig. Failure occurs due to the propagation of plasticity from the shell panels into the circumferential stiffeners. Localized areas have been analyzed to insure that they do not control the containment capacity. A summary of the results of these analyses is presented in Table 3.8.2-9.

Q220.42

3.8.2.6 Materials, Quality Control, and Special Construction Techniques

[redacted]

The interior steel surface of the containment vessel and penetrations are cleaned and coated with materials meeting ANSI N101.2-1972, Section 1.4.2.2, Design Basis Accident Environmental Conditions for PWR's. The environmental conditions for the containment are listed in Section 6.2.1.1 for normal operating conditions and Section 6.2.1.2 for DBA conditions. The integrated radiation dose is 3×10^7 Rads during normal operating conditions and 2×10^8 Rads for DBA conditions.

The coating systems, surface preparation, type of coating, required thickness, limiting temperatures, humidity conditions, acceptance criteria and quality assurance methods are tabulated on Table 3.8.2-3.

All exterior surfaces of the containment vessel and penetrations are coated with a suitable system for outdoor exposure.

No unique or untried construction techniques are used in fabricating the containment vessel. The same construction procedures are used that have been successfully employed at McGuire Nuclear Station which is identical in shape and size.

3.8.2.7 Testing and Inservice Inspection Requirements

3.8.2.7.1 Preoperational Testing and Inspection

(A) Structural Testing

The containment shell, personnel airlocks and equipment hatch are inspected and tested in accordance with the ASME Boiler and Pressure Vessel Code, Section III, Subsection NE. Penetrations are pressure tested as required for class NC in accordance with Section III of the 1974 ASME Code including addenda through the Summer of 1974.

(B) Leakage Rate Tests

Bottom Liner Plate: The bottom liner plate welds are inspected, prior to placing fill concrete, in accordance with the following:

1. Dye penetrant examinations are performed in accordance with Section V of the ASME Boiler and Pressure Vessel Code.

2. Upon completion of the dye penetrant test, the weld seams are covered with test channels and pressure tested. All detected leaks are repaired and retested. The leak test channel layout is shown in Figure 3.8.2-8.

Personnel Air Locks and Equipment Hatch: The personnel air locks are pressurized and a Type B leak rate test is performed as described in Section 6.2.1.4.

The double o-ring compression seals in the equipment hatch are tested for leakage as specified in Section 6.2.1.6.

Containment Leakage Rate Test: Upon completion erection including all penetrations, personnel air locks, equipment hatch, bottom liner plate and structural testing, a leakage rate test is performed on the containment as described in Section 6.2.1.6.

3.8.2.7.2 Operational Surveillance

3.8.2.7.2.1 Structural Integrity

The containment shell is protected by the Reactor Building from adverse environmental conditions. Under operating conditions, the shell does not experience design pressure and temperature load cycling. It is therefore contemplated that additional structural testing of the containment shell other than the initial structural test is not necessary.

Table 3.8.2-4

Containment Materials

Material Location	Material Specification
Base Liners	SA 516, Grade 60
Base Liner Embedments	SA 516, Grade 60 and/or ASTM A36
Knuckle Plate	SA 516, Grade 60
[redacted] Plate	SA 516, Grade 60
[redacted]s (Piping and Electrical)	SA 333, Grade B and/or SA 516, Grade 60
Personnel Locks	SA 516, Grade 70
[redacted]	SA 516, Grade 60
Equipment Hatch	SA 516, Grade 60 and/or Grade 70
Anchor Bolts	SA 320-L43
Anchor Bolts Anchor Plates	SA 516, Grade 60

TABLE 3.8.2-8

STATISTICAL CONTAINMENT MATERIAL PROPERTIES
BASED ON MILL TEST REPORTS

		UNIT 1			Unit 2		
		Mean	Variance	Standard Deviation	Mean	Variance	Standard Deviation
min 32	Yield Strength (KSI)	50.132	3.629	1.905	50.04	4.062	2.014
60	Ultimate Strength (KSI)	69.598	2.979	1.726	69.37	3.246	1.802
	% Elongation	29.322	1.854	1.362	29.115	3.034	1.742

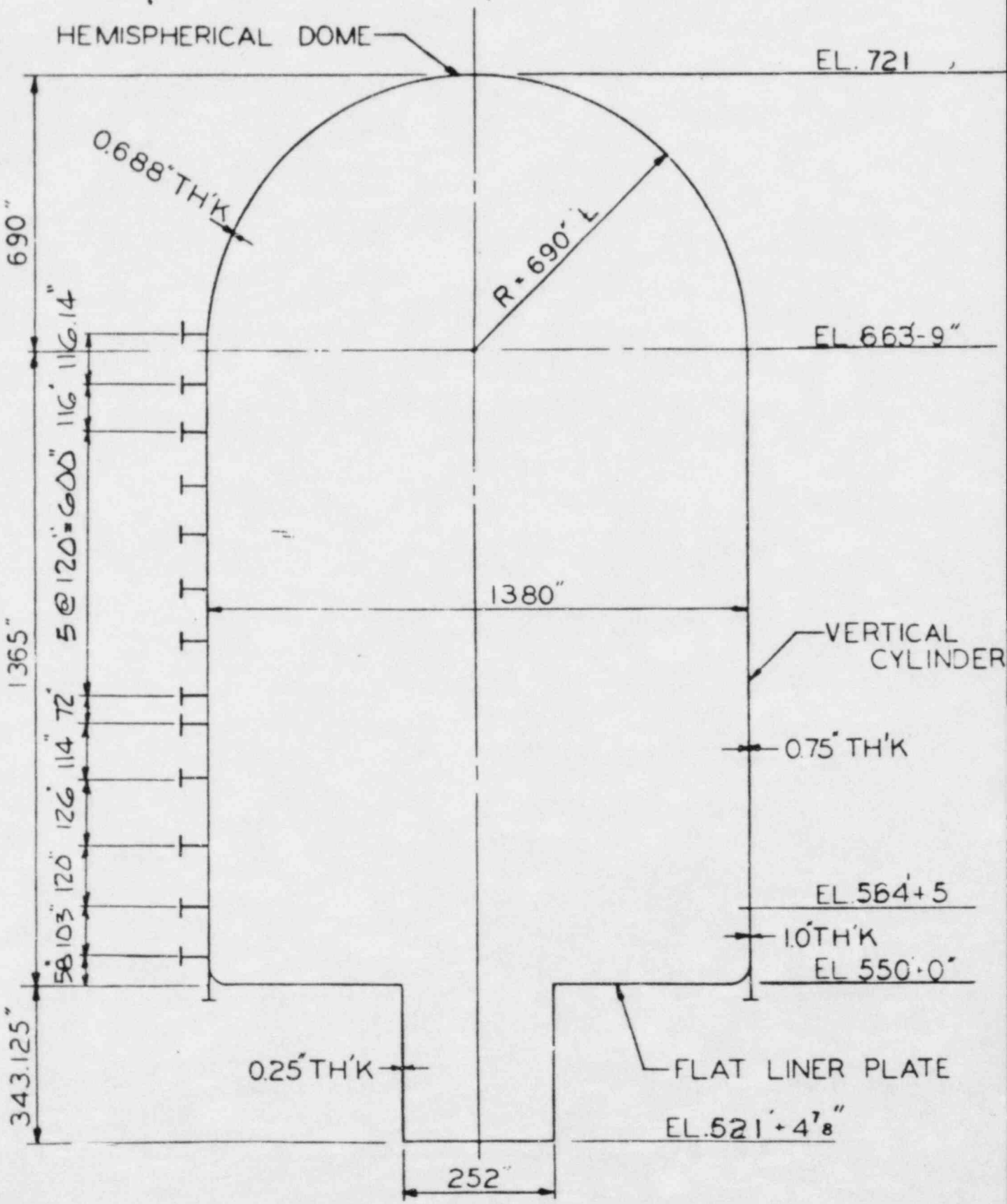
Rev. 6
New Page

TABLE 3.8.2-9

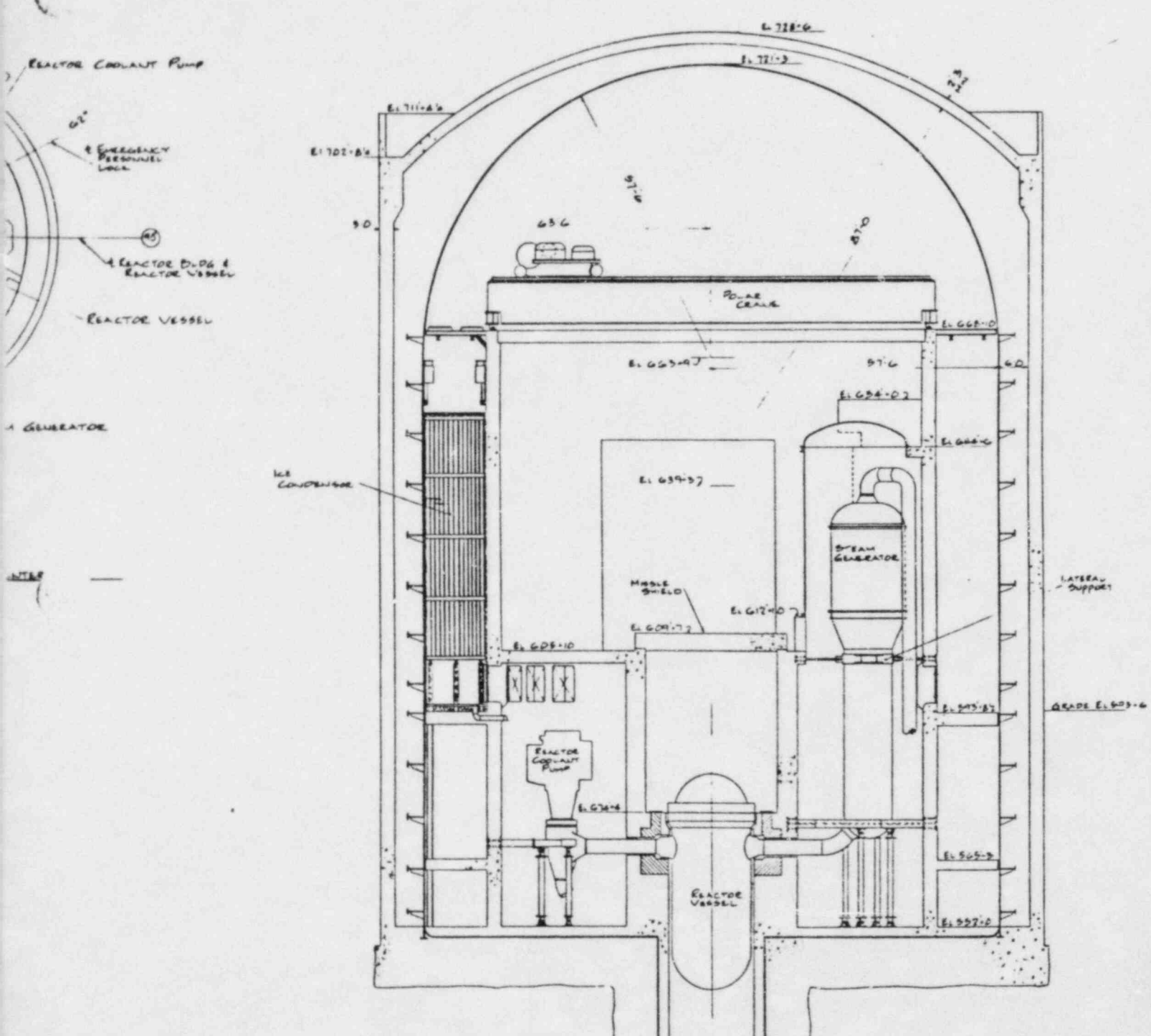
ULTIMATE CONTAINMENT CAPACITY
ANALYSIS SUMMARY

	Location	Ultimate Internal Pressure (PSI)	Criterion
1.	Containment Shell	72	Nonlinear Axisymmetric Analysis
2.	Base Anchorage	81	Concrete Shear
3.	Penetrations		
	a. Personnel Air Lock	79	Plastic Moment in Bulkhead
	b. Equipment Hatch	94	Tensile Failure of Hatch Cover Flange
	c. Spare Penetrations	1275	Yield of Pipe Cap
	d. Electrical Penetrations	> 72	Connector Module Leakage
	e. Bellows Assemblies	> 72	Manufacturer's Recommendation
	f. Purge Penetrations	> 72	Specified to Manufacturer

Rev. 6
New Page



CONTAINMENT GEOMETRY



SECTION A-A
REACTOR BUILDING & CONTAINMENT
STRUCTURAL OUTLINE

REACTOR
STRUCTU

CATAWBA

W-662 1-R1

PHOENIX STEEL CORPORATION

CLAYMONT, DELAWARE

2866

SPECIFICATION ASME SA 516 GR 60 NORMALIZED LONG VEE NOTCH CHARPY IMPACT TESTED @-30 Deg.F., TO NE-2350 (SEC III 1973 & ADDENDA)

CHEMICAL AND PHYSICAL TESTS OF Silicon Quality Steel

CHARGED TO Newport News Industrial Corp
Sub of Newport News Shipbuilding

SHIPPED TO Newport News, Va. 23606

CLAYMONT, DEL. May 13, 1975

CUSTOMER'S ORDER NO. 5024-A-7

MILL ORDER NO. 28624-05

CAR NO. LV 33383

Bend Test: OK

Homogenity Test:

MELT No.	SLAB No.	SERIAL No.	CHEMICAL ANALYSIS Carb	Mang.	Phos.	Sulph.	Si.	Vee-Notch Charpy Impact Tested @ -30 Deg.F.	TEST PIECE Thickness	Sec. Area	Yield Point lbs. Per Sq. In.	Tensile Strength Lbs. Per Sq. In.	Elong. In 8"	SIZE
86793-26	49071	TS NNI 172	.10	1.06	.011	.030	.20	L-38-34-36	.967		50700	67000	31.2	1-140.6#x111x336 ITEM #19
	49072	TS NNI 172						L-78-94-80	.993		51300	70800	30.0	1-2 "
	49073	TS NNI 172						L-110-104-104	.965		49700	70000	30.5	1-3 "
	490,.	TS NNI 172						L-130-110-138	.968		51100	71000	31.0	1-4 "
	49075	TS NNI 172						L-80-90-90	.973		49300	67400	31.5	1-5 "
86795-26	49077	TS NNI 173	.11	1.01	.011	.027	.21	L-102-104-94	.989		51000	70900	29.7	1-6 "
PL 6501	49078	TS NNI 173						L-64-72-66	.994		51900	71400	27.7	1-7 "
86767-26	48839	TS NNI 174	.09	1.14	.008	.024	.23	L-70-60-76	.974		50300	70400	30.2	1-8 "
86788-26	48771	TS NNI 175	.11	1.12	.006	.023	.23	L-110-120-118	.731		52300	71100	27.0	1-130.6#x112x350 ITEM #32
86799-26	49082	TS NNI 176	.10	1.01	.020	.030	.19	L-110-110-104	.731		49800	68600	29.2	2-3 "
	49083	TS NNI 176						L-36-38-40	.719		45300	68400	30.2	1-4 "
	49079	TS NNI 176						L-60-56-58	.728		50200	68700	30.7	1-5 "
	49080	TS NNI 176						L-66-72-70	.730		43700	67100	30.5	2-7 "
	49081	TS NNI 176						L-106-108-106	.723		50100	70700	30.2	1-8 "

OK TO SPEC.
QC ACCEPTED
1 OF 2

N.N.S.C. RECORD CENTER FILE COPY 35

PLATES AND TEST PCS NORMALIZED AT 1600-1650 Deg.F., HELD FOR ONE HOUR PER INCH OF THICKNESS AND AIR COOLED.

I certify the above figures are correct as contained in the records of the Corporation.

Chief of Testing Metallurgical Dept.

SUBSCRIBED AND SWORN TO BEFORE ME

This 15th Day of May

Notary Public

PHOENIX STEEL CORPORATION
CLAYMONT, DELAWARE

SPECIFICATION ASME SA 516 GR 60 Normalized, Long V-Notch Impacts at Minus 30 Deg F to ME-2350 (Sec III 1973 & Addenda) to Meet 15 Ft. Lb. CLAYMONT, DEL. May 20, 1975

CHEMICAL AND PHYSICAL TESTS OF Average Silicon Quality Steel CUSTOMER'S ORDER NO. 5024-A-7

CHARGED TO Newport News Industrial Corp. Subsidiary of Newport News Shipbuilding MILL ORDER NO. 28624-05

SHIPPED TO Newport News, Va. 23606 CAR NO. MILW 60163

Bend Test	Homogenity Test
OK	

MELT No.	SLAB No.	SERIAL No.	CHEMICAL ANALYSIS Vee-Notch Charpy Impact Tested @ -30 DEG F. C	Mang	Phos	Sulph	Si	Mo	TEST PIECE Thickness	Sec. Area	Yield Point lbs Per Sq. In.	Tensile Strength Lbs. Per Sq. In.	% Elong. In 8"	SIZE
86806-26	65789	TS NNI 253	.10	1.20	.016	.018	.22	L-20-28-22		.736		45700	70200	29.5	1 -15 30.6#x114"x336" Item #14
	65790	TS NNI 253						L-84-86-76		.722		52000	71100	28.5	1 -16 "
	65791	TS NNI 253						L-138-138-130		.733		52000	71900	29.2	1 -17 "
	65793	TS NNI 253						L-130-124-130		.737		51600	70300	30.5	1 -18 "
	65794	TS NNI 253						L-106-90-110		.726		49800	71600	30.7	1 -19 "
	65795	TS NNI 253						L-112-112-98		.700		49300	71000	31.2	1 -20 "
86799-26	49085	TS NNI 254	.10	1.01	.020	.030	.19	L-110-90-114		.724		49200	69500	31.5	2 -22 "
86713-26	49483	TS NNI 255	.11	.95	.009	.023	.23	L-76-72-76		.735		51300	71000	31.0	1 -23 "
86713-26	49486	TS NNI 705	.11	.95	.009	.028	.23	L-30-40-36		.718		49600	70500	27.5	1 -24 "
86796-26	65677	TS NNI 255	.10	1.10	.016	.023	.20	L-60-66-56		.728		43500	69600	26.0	1 -2 30.6#x114"x338" Item #15
96875-26 (6506)	65422	TS NNI 256	.13	1.13	.013	.030	.23	L-106-100-100		1.367		47700	68000	33.2	1 -156.1#x112"x222" Item #30 1¼" Thick
For pipe	65423	TS NNI 256						L-88-81-86		1.375		49500	69900	28.7	1 -2 "

PLATES AND TEST PCS NORMALIZED AT 1600-1650 DEG F., HELD FOR ONE HOUR PER INCH OF THICKNESS AND AIR COOLED.

OK TO SPEC.
Cindy Flinn 5-30-75
QC ACCEPTED
1 OF 21
(1 OF 4 - TS NNI 256 ONLY)

SUBSCRIBED AND SWORN TO BEFORE ME

This 29th Day of May

Frances A. Maloney
Notary Public

N. N. I. C.
RECORD CENTER
FILE COPY 50

I certify the above figures are correct as contained in the records of the Corporation.

Supt. of Testing, Metallurgical Dept.

SPECIFICATION FOR CARBON STEEL PLATES FOR PRESSURE VESSELS FOR MODERATE AND LOWER TEMPERATURE SERVICE

SA-516

(Identical with ASTM Specification A 516-73)

1. Scope

1.1 This specification[2] covers carbon steel plates intended primarily for service in welded pressure vessels where improved notch toughness is important.

1.2 Plates under this specifiction are available in four grades having different strength levels as follows:

Grade	Tensile Strength, ksi (MPa)
55	55-65 (379-448)
60	60-72 (414-496)
65	65-77 (448-531)
70	70-85 (483-586)

1.3 The maximum thickness of plates is limited only by the capacity of the composition to meet the specified mechanical property requirements; however, current practice normally limits the maximum thickness of plates furnished under this specification as follows:

Grade	Maximum Thickness, in. (mm)
55	12 (305)
60	8 (203)
65	8 (203)
70	8 (203)

NOTE—The values stated in U.S. customary units are to be regarded as the standard.

2. Applicable Documents

2.1 *ASTM Standards:*

A 20 Specification for General Requirement for Delivery of Steel Plates for Pressure Vessels[3]

3. General Requirements and Basis of Purchase

3.1 Material supplied to this method specification shall conform to the current issue of Specification A 20. These requirements outline the testing and retesting methods and procedures, permissible variations in dimensions, and mass, quality and repair of defects, marking, loading, etc.

3.2 Specification A 20 also establishes the rules for the basis of purchase that should be complied with when purchasing material to this specification.

3.3 In addition to the basic requirements of this specification, certain supplementary requirements are available when additional control, testing, or examination is required to meet end-use requirements. These include:

3.3.1 Vacuum treatment,

3.3.2 Additional or special tension testing,

3.3.3 Impact testing, and

3.3.4 Nondestructive examination.

3.4 The purchaser is referred to the listed supplementary requirements in this specification and to the detailed requirements in Specification A 20.

3.5 If the requirements of this specification are in conflict with the requirements of Specification A 20, the requirements of this specification shall prevail.

4. Manufacture

4.1 *Steelmaking Practice*—The steel shall be made to a fine-grain practice.

5. Heat Treatment

5.1 Plates 1.50 in. (38 mm) and under in thickness are normally supplied in the as-rolled condition. The plates may be ordered normalized or stress relieved, or both.

5.2 Plates over 1.50 in. in thickness shall be normalized.

5.3 When notch-toughness tests are required on plates to this specification, the plates shall be normalized.

5.4 If approved by purchaser, cooling rates faster than still air cooling are permissible for improvement of the toughness provided the plates are subsequently tempered in the range 1100 to 1300°F (590 to 700°C).

6. Chemical Requirements

6.1 The steel shall conform to the chemical requirements shown in Table 1 except as in 6.2.

6.2 Grade 60 plates 0.50 in. (12.7 mm) and under in thickness may be specified to have 0.85-1.20 percent manganese on heat analysis, and 0.80-1.25 percent manganese on product analysis.

7. Metallurgical Structure

7.1 All steel shall have a fine austenitic grain size.

8. Mechanical Requirements

8.1 *Tension Test Requirements*—The material as represented by the tension-test specimens shall conform to the requirements shown in Table 2.

8.2 *Bend Test Requirements*—The bend-test specimen shall withstand being bent cold through 180 deg. without cracking on the outside of the bent portion, around a pin the diameter of which shall have a relation to the thickness of the specimen prescribed in Table 3.

SUPPLEMENTARY REQUIREMENTS

Supplementary requirements shall not apply unless specified in the order.

A list of standardized supplementary requirements for use at the option of the purchaser are included in ASTM Specification A 20. Those which are considered suitable for use with this specification are listed below by title:

S1. Vacuum Treatment,

S2. Product Analysis,

S3. Simulated Post-Weld Heat Treatment of Mechanical Test Coupons,

S4.1 Additional Tension Test,

S5. Charpy V-Notch Impact Test,

S6. Drop Weight Test,

S7. High-Temperature Tension Test,

S8. Ultrasonic Examination, and

S9. Magnetic Particle Examination.

[3] *Annual Book of ASTM Standards*, Part 4.

TABLE 1 Chemical Composition

Elements	Composition, percent			
	Grade 55	Grade 60	Grade 65	Grade 70
Carbon, max:				
½ in. (12.7 mm) and under	0.18	0.21	0.24	0.27
Over ½ in. to 2 in. (50.8 mm), incl	0.20	0.23	0.26	0.28
Over 2 in. to 4 in. (101.6 mm), incl	0.22	0.25	0.28	0.30
Over 4 to 8 in. (203 mm), incl	0.24	0.27	0.29	0.31
Over 8 in.	0.26	0.27	0.29	0.31
Manganese:				
½ in. (12.7 mm) and under:				
Heat analysis	0.60–0.90	0.60–0.90*	0.85–1.20	0.85–1.20
Product analysis	0.56–0.94	0.56–0.94*	0.80–1.25	0.80–1.25
Over ½ in.:				
Heat analysis	0.60–1.20	0.85–1.20	0.85–1.20	0.85–1.20
Product analysis	0.56–1.25	0.80–1.25	0.80–1.25	0.80–1.25
Phosphorus, max	0.035	0.035	0.035	0.035
Sulfur, max	0.04	0.04	0.04	0.04
Silicon:				
Heat analysis	0.15–0.30	0.15–0.30	0.15–0.30	0.15–0.30
Product analysis	0.13–0.33	0.13–0.33	0.13–0.33	0.13–0.33

* See 6.2

TABLE 2 Tensile Requirements

	Grade 55	Grade 60	Grade 65	Grade 70
Tensile strength, ksi (MPa)	55.0–65.0 (379–448)	60.0–72.0 (414–496)	65.0–77.0 (448–531)	70.0–85.0 (483–586)
Yield point, ksi (MPa)	30.0 (207)	32.0 (221)	35.0 (241)	38.0 (262)
Elongation in 8 in. or 200 mm, min, percent	23*	21*	19*	17*
Elongation in 2 in. or 50 mm, min, percent	27	25	23	21

* See Specification A 20

TABLE 3 Bend Diameters

Thickness of Material, in. (mm)	Ratio of Pin Diameter to Specimen Thickness			
	Grade 55	Grade 60	Grade 65	Grade 70
1 (25.4) and under	½	1	1½	2
Over 1 to 2 (50.8), incl	1	1½	2	2
Over 2 to 4 (101.6), incl	1½	2	2	2½
Over 4 to 8 (203), incl	2	2½	2½	3
Over 8	2½	2½	2½	3

4.1.3 Name of material (plates, carbon steel; plates, alloy steel),

4.1.4 ASTM designation (including type, class, and grade as applicable),

4.1.5 Condition (as-rolled, normalized, quenched and tempered, etc. If heat treatment of material is to be performed by the fabricator, this must be so stated. Also, if purchaser specifies a heat-treatment cycle, it must be stated),

4.1.6 Impact test requirements, if any (Section 12). (For Charpy V-notch test, include specimen orientation, testing temperature, and acceptance criteria. For drop-weight test give testing temperature),

4.1.7 Supplementary requirements, if any (test specimen heat treatment, special impact test requirements, etc.), and

4.1.8 Additional requirements, if any.

5. Manufacture

5.1 Unless otherwise specified in the material specification, the steel may be made by any of the following processes: open-hearth, basic-oxygen, electric-furnace, vacuum arc remelt (VAR), or electroslag remelt (ESR).

5.2 The steel may be cast in ingots or may be strand cast. Only the product of a single heat may be strand cast at one time.

5.3 The ratio of reduction of thickness from a strand-cast slab to plate shall be a minimum of 3 to 1.

6. Heat Treatment

6.1 When material is required to be heat treated, the heat treatment may be performed either by the manufacturer or by the fabricator unless otherwise specified in the material specification.

6.2 When heat treatment is required and is to be performed by the fabricator, the order shall so state.

6.3 When heat treatment is to be performed by the manufacturer, the material shall be heat treated as specified in the material specification. The purchaser may specify the heat treatment to be used provided it is not in conflict with the requirements of the material specification.

6.4 When normalizing is to be performed by the fabricator, it may be accomplished by heating uniformly for hot forming. The temperature to which the plates are heated for hot forming shall not significantly exceed the normalizing temperature.

6.5 When no heat treatment is required, the manufacturer at his option may heat treat the plates by normalizing, stress relieving, or normalizing and then stress relieving to meet the material specification.

7. Chemical Analyses

7.1 *Heat Analysis* of each heat shall be made by the manufacturer to determine the percentage of elements specified in the individual material specification. This analysis shall be made from a test specimen preferably taken during the pouring of the heat. The chemical composition thus determined shall be reported to the purchaser, or his representative, and shall conform to the heat analysis requirements of the applicable specification.

7.2 *Product Analysis* representing each plate as-rolled may be made by the purchaser from a broken tension test specimen or from a sample taken from the same relative location as that from which the tension test specimen was obtained. The chemical composition thus determined, as to elements required or restricted, shall conform to the product analysis requirements specified in the applicable specification.

7.3 *Referee Analysis*—For referee purposes, Methods E 30 or E 350 shall be used.

8. Metallurgical Structure

8.1 When a coarse austenitic grain size is specified, the steel shall have a carburized austenitic grain size number of 1 to 5 as determined by the McQuaid-Ehn test. Determination shall be in accordance with Methods E 112, Plate IV, by carburizing for 8 h at 1700 F (927 C). Conformance to this grain size of 70 percent of the grains in the area examined shall constitute the basis of acceptance. One test per heat shall be made.

8.2 When a fine austenitic grain size is specified, the steel shall have a grain size number of 5 or finer as determined by the McQuaid-Ehn test described in 8.1. One test per heat shall be made.

9. Quality

9.1 *General*—Plates furnished under this specification shall be free from injurious defects and shall have a workmanlike finish.

9.2 *Surface Imperfections*:

9.2.1 All injurious surface imperfections shall be removed by the manufacturer.

9.2.2 Shallow imperfections shall be ground to sound metal; the ground area shall be well faired and the thickness of the ground plate shall not be reduced below the minimum thickness permitted in Section 14.

9.2.3 All surface imperfections, the removal of which will reduce the plate thickness below this minimum, shall be cause for rejection of the plate; however, by agreement with the purchaser, the metal so removed may be replaced with weld metal as provided in 9.4, Repair by Welding.

9.3 *Edge Imperfections:*

9.3.1 Laminar-type discontinuities 1 in. (25 mm) and less in length visible to the unaided eye on the edges of a plate as prepared for shipment by the manufacturer are acceptable and do not require exploration.

9.3.2 All larger discontinuities shall be explored to determine their depth and extent. Discontinuities shall be considered continuous when located in the same plane within 5 percent of the plate thickness and separated by a distance less than the length of the smaller of two adjacent discontinuities.

9.3.3 Indications visible to the unaided eye on the cut edges of a plate as prepared for shipment by the manufacturer shall not exceed the limits given in Columns 1 and 2 of Table 15.

9.3.4 Larger indications shall be removed by the manufacturer by grinding provided the resultant cavity does not exceed the limits given in Columns 3 and 4 of Table 15.

9.3.5 Indications of greater magnitude shall be cause for rejection of a plate; however, by agreement with the purchaser, the defects may be removed and replaced with weld metal as provided in 9.4.

9.3.6 Indications on the edges of a plate cut during the fabrication shall be cause for rejection of the plate at the discretion of the purchaser when the magnitude exceeds the limits given in Columns 5 and 6 of Table 15. The defects may be removed and replaced with weld metal as provided in 9.4.

9.4 *Repair by Welding:*

9.4.1 Repair welding shall be permitted only with the approval of the purchaser.

9.4.2 Preparation for repair welding shall include inspection to assure complete removal of the defect.

9.4.3 Repairs shall be made utilizing welding procedures qualified in accordance with Section IX of the ASME Code and repair welding shall be done by welders or welding operators meeting the qualification requirements of ASME Section IX.

9.4.4 The weld metal shall have the A-number analysis corresponding to the equivalent ASME P number of the plate material except that A-1 or A-2 analysis weld metal may be employed for P-1 materials. Other weld metals may be employed that are compatible with the base material being repaired, when so approved by the purchaser. Such weld metals must be qualified in accordance with the requirements of Section IX of the ASME Code.

9.4.5 If Charpy impact tests are required on the plate material, the welding procedure qualification tests shall also include Charpy impact tests of the weld, heat affected zone, and plate material and shall be reported to the purchaser.

9.4.6 If the plate material is subjected to normalizing, quenching and tempering, hot forming, or post-weld heat treating, the welding procedure qualification test plates and the weld repaired plate shall be subjected to the thermal heat treatment as specified by the purchaser.

9.4.7 In addition, repair welds shall meet the requirements of the construction code specified by the purchaser.

10. Methods of Test

10.1 All tests shall be conducted in accordance with Methods and Definitions A 370.

11. Tension and Bend Tests

11.1 *Number of Tests*—One tension and one bend test shall be taken from each plate as-rolled, except that on plates quenched and tempered by the manufacturer, two tension tests and one bend test shall be taken from each plate as heat treated. When plates are furnished in the unheat treated condition and qualified by heat treated test specimens, one tension and one bend test shall be taken from each plate as-rolled.

11.2 *Orientation of Tests*—The longitudinal axis of the tension- and bend test specimens shall be transverse to the final rolling direction of the plate.

11.3 *Location of Tests:*

11.3.1 The tension test specimen shall be taken from a corner of the plate. The bend test specimen shall be taken from the middle of a plate end. For quenched and tempered plates, the tension test specimens shall be taken from a corner of the plate at both ends of the plate.

11.4 *Tests from Heat-Treated Plates:*

11.4.1 When heat treatment is performed by the manufacturer, the test specimens shall be taken from the plate in the heat-treated condition or from full-thickness coupons simultaneously heat treated with the plate.

11.4.2 When heat treatment is to be performed by the fabricator, the plates shall be accepted on the basis of mill tests made on specimens taken from full thickness coupons heat treated in accordance with the requirements specified in the material specification or on the order. If the heat-treatment temperatures are not specified, the manufacturer shall heat treat the coupons under conditions he considers appropriate. The purchaser shall be informed of the procedure followed in heat treating the specimens at the mill.

11.4.3 When the plate is heat treated with a cooling rate faster than still-air cooling from the austenitizing temperature, one of the

CN-2NI-15

Plate –

Material reqmts – NE-200
physical/mec – "

Contmt – Des., fab. Constr. & Test NE, (71S72) NE-3133 -3324
– No code Stamp
– Base liner U/T per NB-2532.1
– Design Reqmts for plate around Penetrs. NE3330

– Fabr. & Erection NE-4000
– NDE of welds NE-500

Penetrs. Sleeves – M406 & 407
– On Contmt, Assembly # 2-2-6 NP-97 1" thick
– Newport News Industrial Corp.
– Job Order # 5024 A, Dwg. 288179 E1
Record – NDE (MT) Weld history Record
*UT rejectable incls. A(?) type defects on report for 501 A&B seam 2-20-3 (10-12-76); Repaired and reinsp. on 10-20-76 Accept.

Joint #	Seam	Dwg #	Rev
502A&B	1-16-2	288179 E1	
501A&B	2-20-3	288108 C	
	1-16-3		
	1-16-4		
503	1-16-1A&B		
504	2-20-2A&B		

502 A&B (1-16-2) UT reject 10/12/76
Accept 10/14/76

503 (2-20-2)
504 (1-16-1)

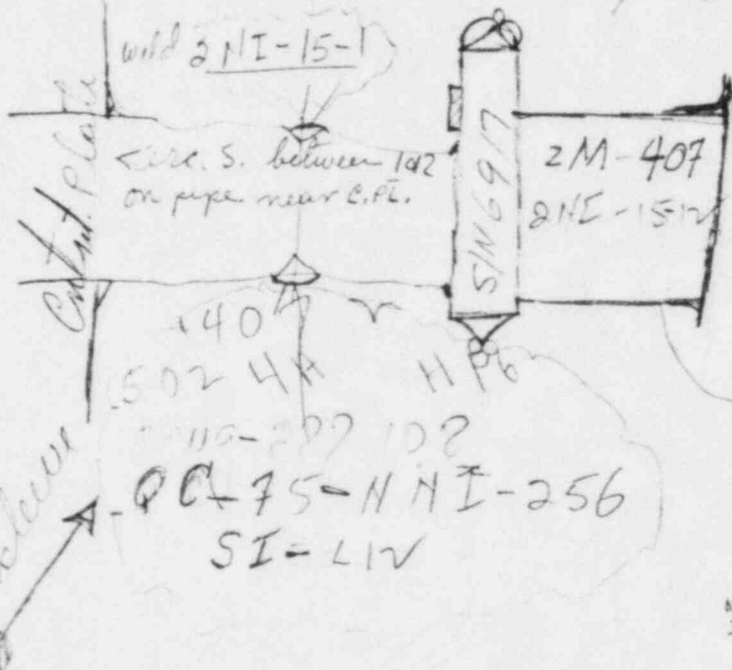
Shirley QA
406

See Brad Jones

Pent. 2NI-15 Elev 555+

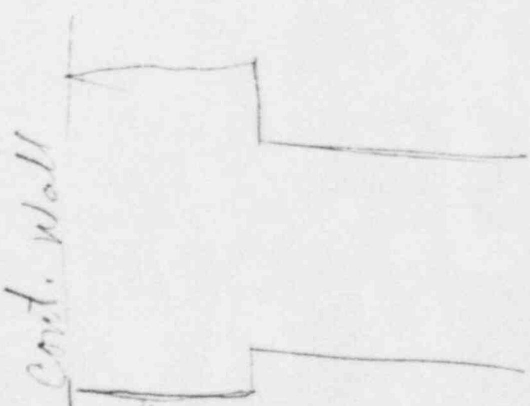
83-44
-36

Bellows Code PL (1/PT) - Cl-2, 1977
ϕ 20" S/N H6917



Welders -
Cntmt to Pipe - P31, P19 & 51
welders →
weld 2NI-15-1 1.341 x 32" ϕ
Dwg# CN-2NI-15

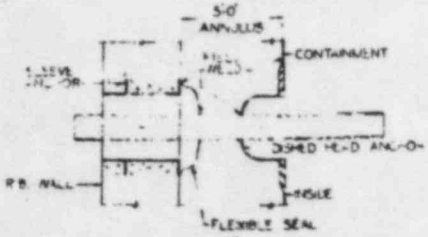
Dwg Item
6501 - PL # 75-NNI-173
6506 - Pen. Sleeve 75-NNI-256
M-406 & -407
6505 - Pen Sleeve 75-NNI-256
M-405, -404



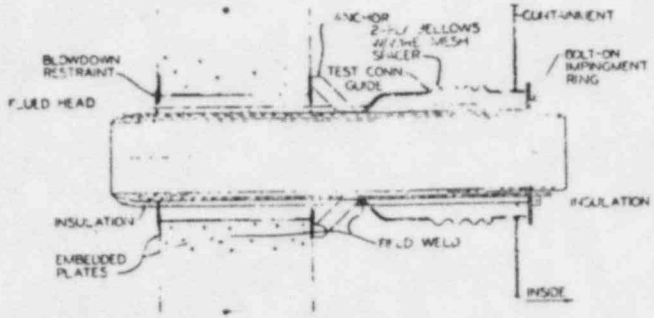
SA-105
HT-519305-B2
APN # 670
APMCO, S/N 6916-1
Mark # 2-M407

Spare Pens. in Process
Welder - J F Upright - X38
Pen. 2POE-125 W.P.L-355
12" ϕ sch. 100 -128 ✱ comp
-131 ✱
Welder stand no ... -242 tacked
-241 comp.
were seen on any
of them pen.

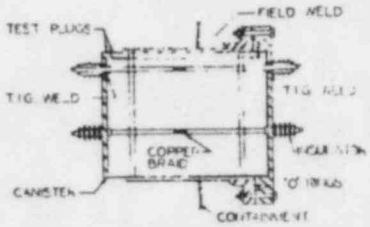
2POE-251 —
-239 } tacked
-227 }



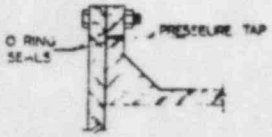
TYPICAL COLD PENETRATION



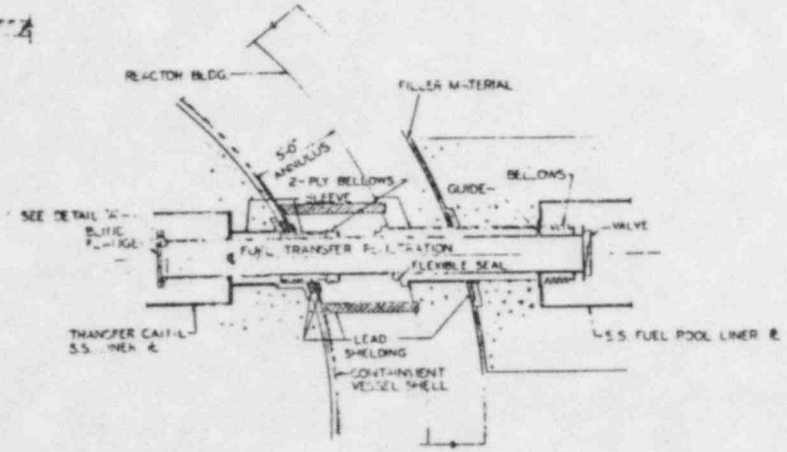
TYPICAL HOT PENETRATION



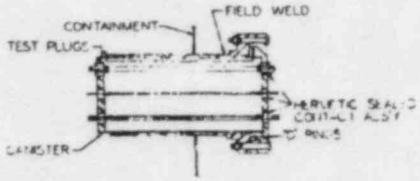
TYPICAL MEDIUM VOLTAGE POWER AND CONTROL PENETRATION



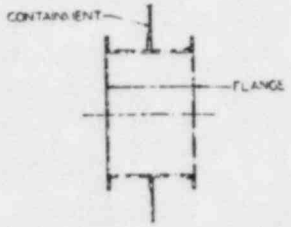
DETAIL 'A'



FUEL TRANSFER PENETRATION



TYPICAL LOW VOLTAGE POWER, CONTROL & INSTRUMENTATION PENETRATION



PURGE PIPING PENETRATION

Weld 2WI-15-1

1. Original weld was rejected by radiography and authorized to be cut out on January 16, 1981. Welders T-69, 570 and P-31 fabricated the weld.

2. The cut out areas were prepared for welding and repaired using Construction Procedure CP-123. The repair was tested and found acceptable by magnetic partical inspection. Welder T-95 performed the repair.

3. Weld was lubricated between 3/10-20/81 and rejected by radiography for lack of fusion and slag on 3/25/81. Welders T-95 and P-31 fabricated the weld.

Laminations

p. 154

(1) service pipe to bellows torch-cut

(2) prepared for welding

NOTE: HSN performed 4th repair which began on 2/20/81 and completed on 2/24/81.
used 3/32" and 1/8" E7018 to SMAW.

X-Ray 2/27/81
Rejected *4-5, *5-6, 6-7 (P and *dim.)
Reshot 3/4/81 3-4 LCF; 4-5, 5-6, 6-0 film overlap

5th repair made to correct LCF by welder P-31
X-Rayed on 3/27/81 final

(3) laminar indications in serv. pipe identified and removed — HSN not involved in removal of these inds.

Method and Specification for

LONGITUDINAL WAVE ULTRASONIC INSPECTION OF STEEL PLATES FOR PRESSURE VESSELS

SA-435

(Identical with ASTM A435-73 except that Section V, Article 1, General Requirements, also applies. May be used when ultrasonic examination of plates is required by a referencing Code Section and as source material in preparation of detailed procedures.)

1. Scope

1.1 This method covers the examination procedure and acceptance standards for the pulse-echo ultrasonic inspection of rolled carbon and alloy steel plates, $\frac{3}{4}$ in. (19.05 mm) in thickness and over, of fully killed pressure vessel quality. It was developed to assure delivery of steel free from gross internal discontinuities such as pipe, ruptures or laminations and is to be used whenever the inquiry, contract, order or specification states that the plates are to be subjected to ultrasonic inspection.

NOTE—The values stated in U. S. customary units are to be regarded as the standard. The metric equivalents of U.S. customary units given in the standard may be approximate.

2. Apparatus

2.1 The manufacturer shall furnish suitable ultrasonic equipment and qualified personnel necessary for performing the test. The equipment shall be of the pulse-echo longitudinal beam type. The transducer shall be 1 to $1\frac{1}{8}$-in. (25.4 to 28.6-mm) diameter or 1-in. (25.4-mm) square. The test shall be performed by one of the following methods: direct contact, immersion, or liquid column coupling.

3. Test Conditions

3.1 The inspection shall be conducted in an area free from operations that interfere with proper functioning of the equipment.

3.2 The plate surface shall be sufficiently clean and smooth to maintain a reference back reflection from the opposite side of the plate at least 50 per cent of full scale during scanning.

3.3 The surface of plates inspected by this method may be expected to contain a residue of oil or rust or both. Any specified identification which is removed when grinding to achieve proper surface smoothness shall be restored.

4. Procedure

4.1 Unless otherwise specified, ultrasonic inspection shall be made on either major surface after final treatment and prior to shipment.

4.2 A nominal test frequency of $2\frac{1}{4}$-MHz is recommended. Thickness, grain size or microstructure of the material and nature of the equipment or method may require a higher or lower test frequency. A clear, easily interpreted trace pattern should be produced during the inspection.

4.3 The inspection shall be conducted with a test frequency and instrument adjustment that will produce a minimum 50 to a maximum 75 per cent of full scale reference back reflection from the opposite side of a sound area of the plate.

4.4 Scanning shall be continuous along perpendicular grid lines on nominal 9-in. (23-cm) centers, using a suitable couplant such as water, soluble oil, or glycerin.

4.5 Grid lines shall be measured from the center or one corner of the plate with an additional path within 2 in. (5 cm) of all edges of the plate on the searching surface.

A-516 GR-70, ¶ 3.1 refers to A-20 which references SA-435 for UT acceptance criteria ¶ 5.1

4.6 Where complete loss of back reflection is detected along a given grid line, the entire surface area of the squares adjacent to this indication shall be continuously scanned. The boundaries of areas where complete loss of back reflection is detected shall be established.

5. Acceptance Standards

5.1 Any discontinuity indication causing a total loss of back reflection which cannot be contained within a circle, the diameter of which is 3 in. (7.6 cm) or one half of the plate thickness, whichever is greater, is unacceptable.

5.2 The manufacturer reserves the right to discuss rejectable ultrasonically tested plates with the purchaser with the object of possible repair of the ultrasonically indicated defect before rejection of the plate.

5.3 More restrictive standards of acceptance will be subject to agreements between the purchaser and the supplier.

5.4 The purchaser's representative may witness the test.

SUPPLEMENTARY REQUIREMENTS

This requirement shall apply only if specified in the order.

S1. A scanning procedure other than that specified in 4.3 and 4.4 shall be as agreed upon between manufacturer and purchaser.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

JAN 20 1984

Duke Power Company
ATTN: Albert V. Carr, Esq.
422 South Church Street
Charlotte, NC 28242

Gentlemen:

SUBJECT: REPORT NOS. 50-413/84-03 AND 50-414/84-03

On January 3-6 and 11-13, 1984, NRC inspected activities associated with your application for an NRC Construction Permit Nos. CPPR-116 and CPPR-117 for the Catawba facility. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed inspection report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

Within the scope of the inspection, no violations or deviations were identified.

Your attention is invited to unresolved items identified in the inspection report. These matters will be pursued during future inspections.

Due to the restricted distribution of this report pursuant to the Catawba Licensing Board's November 1, 1983 protective order, the NRC has been informed by Duke Power company that proprietary review of this document has been waived in order to assure prompt distribution to the parties in the Catawba Licensing proceeding. Prior to any public release of this report, Duke Power Company will be given an opportunity to indicate whether proprietary information is contained in the report, if they have not previously so indicated.

Should you have any questions concerning this letter, please contact us.

Sincerely,

Hugh C. Dance, Chief
Project Branch 2
Division of Project and
Resident Programs

Enclosure:
Inspection Report Nos. 50-413/84-03
and 50-414/84-03

8403160356

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report Nos.: 50-413/84-03 and 50-414/84-03

Licensee: Duke Power Company
422 South Church Street
Charlotte, NC 28242

Docket Nos.: 50-413 and 50-414

License Nos.: CPPR-116 and CPPR-117

Facility Name: Catawba 1 and 2

Inspection at Catawba site near Rock Hill, South Carolina

Inspector: N. Economos — Date Signed: 1/20/84

Approved by: J. J. Blake, Section Chief
Engineering Program Branch
Division of Engineering and Operational Programs — Date Signed: 1/20/84

SUMMARY

Inspection on January 3-6 and 11-13, 1984

Areas Inspected

This special unannounced inspection involved 41 inspector-hours on site in the areas of containment spray-welding, welding material control, and radiographic examination.

Results

No violations or deviations were identified.

8403160363 900131
PDR

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. C. Rogers, Project Manager
*R. L. Dick, Vice President-Construction
*W. O. Henry, QA Manager-Technical Service
*R. A. Morgan, Senior QA Engineer
*S. W. Dressler, Construction Engineer
*L. R. Davison, QA Project Manager
*J. C. Shropshire, QA Engineer Mechanical Welding, NDE
D. H. Llewellyn, Group Leader, Technical Support-Welding
B. Gillespie, QA Welding NDE
J. E. Cavender, NDE Examiner - Level III

Other licensee employees contacted included construction craftsmen, technicians, and office personnel.

NRC Resident Inspectors

P. K. VanDoorn
P. Skinner

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on January 6, 1984, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed the inspection findings listed below.

Inspector Followup 413/84-03-01 Incorrectly dated radiographs weld 1NS-136-2, paragraph 5.

Unresolved Item 413/84-03-02 Apparent lack of penetration indication weld 1CF-029-07, paragraph 6.

3. Licensee Action on Previous Enforcement Matters

Not inspected.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve violations or deviations. New unresolved items identified during this inspection are discussed in paragraph 6.

5. Containment Spray Piping - Observation of Completed Work; Review and Evaluation of Quality Records - Unit 1

This work effort was performed in order to ascertain by direct observation, interviews, and independent evaluation of work performance and completed work as applicable whether activities relative to the containment spray (NS) system were accomplished in accordance with NRC/Code requirements and FSAR commitments. The NS system was designed, fabricated and tested as a Quality Class B system in accordance with Section III of the ASME Boiler and Pressure Vessel Code, 1974 Edition including summer 1974 addenda. Design considerations including its description, function and design evaluation are addressed in Section 6.2.2 and Tables 3.2.2-2 and 3.2.2-3 of the Catawba Nuclear Station FSAR. Additional design parameters are delineated in FSAR Figure 6.2.2-1, Flow Diagram of Containment Spray System. Note 13 of this figure specifies that schedule 40 piping be used for all lines in the reactor building for stress analysis purposes. All NS piping in contact with borated water is required to be made of austenitic stainless steel material. Specifically, piping was required to be produced from ASME, SA-312-74 Section III Class 2 material which required hydrostatic testing and ultrasonic examination. Elbow fittings were required to be produced from ASME, SA-403 Section III (74S74) material. All welding was specified to be performed by welding procedures and welders qualified under the requirements of Section IX of the ASME Boiler and Pressure Vessel Code.

At the time of this inspection all welding activity on this system was complete. Work activity on this system was observed earlier under the requirements of Manual Chapter 2512 - LWR Inspection Program - Construction Phase. This effort was documented in reports 50-413/79-02, 50-413/80-02, 50-413/80-10 and 50-413/80-18.

Therefore, in lieu of observing in process pipe welding and/or pipe installation activities, to confirm compliance with applicable code and QA procedural requirements the inspector observed: (1) randomly selected completed welds; (2) reviewed respective weld process control sheets, certified material test reports for pipe and weld materials, welder and weld procedure qualifications and radiographs; (3) interviewed craft directly involved in the aforementioned activities.

Completed welds selected for observation included:

WELD	SIZE	DWG#
1NS-92-13	8" sch. 40	CN-1491-NS009 Rev. 2
-17	8" sch. 40	CN-1491-NS022 Rev. 3
-18	8" sch. 40	CN-1491-NS022 Rev. 3
-19	8" sch. 40	CN-1491-NS022 Rev. 3
-20	8" sch. 40	CN-1491-NS022 Rev. 3
1NS-77-12	8" sch. 40	CN-1491-NS009 Rev. 2

WELD	SIZE	DWG#
1NS-95-1	8" sch. 40	CN-1491-NS019 Rev. 3
-2	8" sch. 40	CN-1491-NS019 Rev. 3
-2A	8" sch. 40	CN-1491-NS019 Rev. 3
-3	8" sch. 40	CN-1491-NS019 Rev. 3
-4	8" sch. 40	CN-1491-NS019 Rev. 3

These joints were observed for weld appearance including surface condition amount of reinforcement, undercut, slag, porosity, arc strikes and transition as applicable.

RADIOGRAPHY - The inspector requested and the licensee retrieved radiograph packages for the following welds for review. General Radiograph Procedure NDE-10A/6, written to comply with AMSE Section V Boiler and Pressure Vessel Code (80W82) Articles 1 and 2, was used to radiograph these welds.

WELD	SIZE	FABRICATION HISTORY
1NS-98-02	8" sch. 40 (.322")	Single repair for each of fusion (LOF) accepted on 9-10-80
1NS-98-03	8" sch. 40 (.322")	Single repair for LOF, accepted on 11-25-80
1NS-106-2	8" sch. 40 (.322")	No repairs, accepted on 8-21-80
1NS-106-3	8" sch. 40 (.322")	No repairs, accepted on 6-11-80
1NS-115-2	8" sch. 40 (.322")	No repairs, accepted on 9-12-80
1NS-115-3	8" sch. 40 (.322")	No repairs, accepted 6-30-80
1NS-125-3	8" sch. 40 (.322")	No repairs, accepted on 6-11-80
1NS-125-2	8" sch. 40 (.322")	Seven (7) repairs LOF, accepted on 9-30-80
1NS-136-2	8" sch. 40 (.322")	No repairs, accepted on 7-27-80
1NS-136-3	8" sch. 40 (.322")	No repairs, accepted on 6-7-80
1NS-148-2	8" sch. 40 (.322")	No repairs, accepted on 7-27-80
1NS-148-3	8" sch. 40 (.322")	No repairs, accepted on 6-7-80
1NS-95-1	8" sch. 40 (.322")	No repairs, accepted on 1-7-80
1NS-95-2A	8" sch. 40 (.322")	Six repairs, accepted on 7-16-81

Radiographs for each of these welds were reviewed for compliance with applicable code and procedural requirements including technique, weld coverage, density, penetrameter size and location, artifacts, documentation of findings and accuracy.

Within these areas, the inspector noted that the radiographs for weld 1NS-136-2, positions 0-1 and 1-2 had been dated 7-12-80 instead of 7-27-80 the correct date. This matter was brought to the licensee's attention for corrective action. The radiographs were nonconformed and the item was identified as inspector followup item 413/84-03-01, Incorrectly dated radiographs.

QUALITY RECORDS - Piping adjoining the aforementioned welds were manufactured from stainless steel material produced from heat numbers 8C41936, 28569, 281002 and RW152947. For these heats of material the inspector reviewed certified material test reports to ascertain whether the reported properties, including chemical analysis, thermal treatment and mechanical properties, were consistent with the aforementioned material specification.

Similarly, quality records for welding materials used to fabricate the aforementioned welds were reviewed for compliance with applicable code requirements. These welding materials included the following:

TYPE	SIZE	HEAT
ER308	1/16"d	04184
ER308	3/32"d	C3064
ER308	1/8"d	06393

Weld Process Control Sheets or Form M-4A along with Detailed Process Control Sheets or Form F-9B, used to control and document the fabrication history of field welds, were reviewed for completeness and documentation accuracy. Areas of specific interest included inspection hold points, repairs, welding materials used, welders and weld procedures.

WELDER PERFORMANCE QUALIFICATIONS - Of the welders used to fabricate the aforementioned welds, the inspector selected a random sample to review their performance qualification records and thereby ascertain whether their qualification met ASME Code Section IX requirements. Performance records were selected for welders with the following stencil numbers: N-94, H-03, 571, E-48, P-30, P-99, A-05 and 248.

FINDINGS - In addition to this review, certain welders were interviewed in the privacy of the NRC resident inspectors office. The interviews focused on the methods used to erect and fabricate the NS system. Topics of specific interest included the possible use of excessive force (cold spring) to attain weld fit-up, omission of inspection points, adherence to procedural requirements and harassment by field supervision (foreman

override) in order to expedite work. Although these interviews are discussed in detail in the attached appendix to the report, the inspector found no evidence of code/procedural deviations in the fabrication of the NS piping system. Under the subject of foreman override, the inspector found that while some individuals may have held their foremen in relatively low esteem in terms of qualification and ability to manage the crew this was not pervasive and may have been a personality problem. The vast majority of the craft interviewed spoke very favorably of their past and present field supervisors (foreman).

6. Welding Material Control

Control of welding material is checked periodically by the NRC under the requirements of the LWR Construction Inspection Program. The licensee's weld material control program is implemented through approved procedures H-3 Identification and Control of Welding Material and, CP-39 Reconditioning of Low-Hydrogen Coated Electrodes and Loading Electrode Ovens. The inspector's most recent work effort in this area was documented in report numbers 413/83-36, 414/83-31 dated November 15, 1983. The present work effort was performed in response to a concern over the quality of certain TIG wire filler metal ER70S-2 classification. Specifically the concern was that inferior quality TIG wire was used on safety-related welds. The material was said to have a black streak, possibly scale, gouged into the surface of the wire. The condition appeared as a black streak which was visible to the naked eye, after the protective coating was removed. Allegedly when used to weld, the material caused turbulence in the weld puddle, excessive slag and sparkling. Allegedly the material was difficult to use and resulted in poor weld quality, high rejection rates and a lowering of welder morale. The material in question was produced from heat number 97405 and manufactured to the requirements of material specification SFA5.18 and of Paragraph NB-2400 of the ASME Code, 1977 Edition with latest addendum. A review of quality records disclosed that the material was received, inspected per procedure P-1A, revision 13 requirements on February 18, 1980, and released by QA on February 20, 1980. The certificate of compliance on file, was reviewed to ascertain whether chemical analysis and mechanical properties met minimum code requirements and found to be satisfactory. Weld process control sheets (M-4As) and radiographs of randomly selected safety-related welds, showing that the material was used in the fabrication process, were reviewed to determine whether there was any relationship between the material in question and the type and frequency of rejectable indications e.g., excessive porosity revealed by radiography. Welds selected for this review were as follows:

AUXILIARY FEEDWATER	SIZE	COMMENTS
1CA-069-13	6" x .432"	Porosity in one station near root - acceptable
1CA-069-18	4" x .337"	Portion of weld made with Ht #97405 acceptable

AUXILIARY FEEDWATER	SIZE	COMMENTS
Reactor Coolant 1NC-116-006	2" x .168"	Magnetic Particle inspection acceptable
Diesel Generator Cooling Water System 1KD-023-005	6" x .280"	Magnetic Particle inspection acceptable
1SM-038-002	34" x 1.426"	Root of weld made with Ht #97405 filler metal acceptable. One indication near weld crown detected by liquid penetrant.
1SM-088-010	34" x 1.426"	No repairs
1SM-034-002	34" x 1.451"	Original weld rejected and cut-out. Four repairs resulting from lack of fusion, slag and porosity in weld portion made from other weld metal.
1SM-032-001	34" x 2.00"	No repairs
1SM-024-01	34" x 1.45"	Root of weld made with Ht #97405 acceptable. Thee repairs resulting from lack of fusion, slag and porosity made with other weld material.
1SM-024-02	34" x 1.45"	No repairs
Feedwater System 1CF-029-07	18" x .938"	Apparent indication of lack of penetration between station 1-2 of the accepted radiograph.
1CF-034-07	18" x .938"	No repairs
Safety Injection Penetration Sleeves 2NI-15-01	32" x 1.34"	Root of original joint welded in part with Ht #97405 filler metal, rejected for lack of fusion. Rewelded and repaired three times prior to acceptance - Ht #97405 not used for repairs.

AUXILIARY FEEDWATER	SIZE	COMMENTS
2NI-16-01	32" x 1.34"	Root of joint welded with Ht #97405 filler metal acceptable. Joint repaired five times before acceptance. Ht #97405 filler metal used on second and third repairs, rejected because of lack of fusion, slag and porosity.

Of the 14 welds selected for review radiography, where applicable, showed that the root portion of the joints where this material was used exhibited some evidence of porosity and/or slag, however, the amounts were no more than what normally appears in welds of this size and type. However, in all cases these indications met minimum code requirements.

In addition, during the interviews, welders who the records showed had used this material were asked if they had encountered similar problems. In response, some stated that they recalled using the material and finding the condition described, however they stated that upon discovery defective material was returned to the issuing station or discarded. Others stated that they were not aware of this particular problem but that as a general rule the protective coating on this type of filler metal was removed with sand paper available for this purpose at the issuing station. Of the eighteen welders interviewed no one indicated that his foremen pressured him in any way to use defective/faulty material to fabricate safety-related welds. Details of these interviews are attached as an appendix to this report. In reference to weld 1CF-029-07, and the apparent lack of penetration indication identified during this review, the inspector discussed the matter with the licensee's Level III examiner who argreed to investigate the matter further and report on a future inspection. This matter was identified as unresolved item 413/84-03-02, Apparent Lack of Penetration Indication, Weld No. 1CF-029-07.

FINDINGS - Results of this work effort would indicate the material in question met minimum chemical and mechanical properties required by the applicable code. This material was not used beyond February of 1981. Randomly selected welds fabricated with this material were of sound quality as evidence by their respective radiographs. The amount of nonmetallic inclusions found in the welds were consistent with this type of material, weld thickness and process. Welders interviewed were knowledgeable of problems related to this type material and took appropriate corrective measures when necessary. The contention that welders were pressured into using defective material on safety-related welds could not be substantiated. Therefore, on the basis of this work effort it would appear that although a certain portion of this material was defective, there was no evidence to substantiate that the defective pieces were used to fabricate safety-related welds. Instead, the evidence would indicate that upon discovery it was discarded. On the basis of these findings the staff feels that further work effort into this matter is unwarranted.

7. Radiography

This work effort was performed in response to a concern that film overlays used to locate weld metal defects rejected by radiography were not reliable because the indications depicted on the overlays could not be located by the usual grinding methods. Allegedly this situation raised questions among the craft, about the reliability of these overlays and the competency of the radiographers/interpreters involved in this activity.

The applicable code and approved Duke procedure used for radiography for safety related welds was discussed earlier in paragraphs 5 and 6 of this report. The work effort described in paragraphs 5 and 6 included the review of radiograph packages of approximately 26 safety-related pipe welds with diameters ranging from 4" to 34" and thickness from 0.33" to 2.00."

The radiographic reader-sheets used by film interpreters to document their findings were reviewed and evaluated for evidence of possible errors in identifying defects, their location and code compliance. In addition, eighteen welders selected at random were interviewed on various aspects of their work including their assessment of the accuracy/reliability of film overlays to detect weld defects identified by radiography. In response, most welders recalled isolated instances where, upon repairing an indication identified on the overlay, the radiograph of the repair would show an indication not shown on the previous overlay. However, in most cases, they were quick to explain that it was their understanding that this was possible because of different angle shots and techniques used to radiograph these welds. The vast majority of welders interviewed expressed confidence in the competence of radiographers and in the accuracy of the overlays. Details of these interviews are attached as an appendix of this report.

FINDINGS - This work effort disclosed that in certain instances weld overlays may not depicted accurately all the indications within a certain area of the weld. This may be attributed in part, to technique, angle of exposure, type of indication and its location/orientation. The alleged pervasive lack of confidence in the radiographers/interpreters could not be substantiated. Moreover, this work effort would indicate that the location of weld defects as depicted on the overlays were reasonably accurate as evidence by the testimony of welders interviewed. The inspector's review of the aforementioned radiographs showed no evidence of discrepancies in interpretation, documentation and/or code violations. Therefore, on the basis of these findings the staff feels that further work effort into this matter is unwarranted.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

B. Jones

DEC 21 1983

Duke Power Company
ATTN: Mr. H. B. Tucker, Vice President
Nuclear Production Department
422 South Church Street
Charlotte, NC 28242

Gentlemen:

SUBJECT: REPORT NOS. 50-413/83-53 AND 50-414/83-40

On December 6-9, 1983, NRC inspected activities authorized by NRC Construction Permit Nos. CPPR-116 and CPPR-117 for your Catawba facility. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed inspection report.

Areas examined during the inspection are identified in the report. Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress.

Within the scope of the inspection, no violations or deviations were identified.

In accordance with 10 CFR 2.790(a), a copy of this letter, its enclosures, and your reply will be placed in NRC's Public Document Room upon completion of our evaluation of the reply. If you wish to withhold information contained therein, please notify this office by telephone and include a written application to withhold information in your response. Such application must be consistent with the requirements of 2.790(b)(1).

Should you have any questions concerning this letter, please contact us.

Sincerely,

Hugh C. Dance

Hugh C. Dance, Chief
Project Branch 2
Division of Project and
Resident Programs

Enclosure:
Inspection Report Nos. 50-413/83-53
and 50-414/83-40

cc w/encl:
J. W. Hampton, Station Manager
J. C. Rogers, Project Manager

8401060234

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report Nos.: 50-413/83-53 and 50-414/83-40

Licensee: Duke Power Company
422 South Church Street
Charlotte, NC 28242

Docket Nos.: 50-413 and 50-414

License Nos.: CPPR-116 and CPPR-117

Facility Name: Catawba 1 and 2

Inspection at Catawba site near Rock Hill, South Carolina

Inspector: Nick Economos 12/21/83
N. Economos Date Signed

Approved by: [signature] 12/21/83
J. J. Blake, Section Chief Date Signed
Engineering Program Branch
Division of Engineering and Operational Programs

SUMMARY

Inspection on December 6-9, 1983

Areas Inspected

This routine, unannounced inspection involved 36 inspector-hours on site in the areas of Containment (Penetrations) - Observation of Work activities and Review and Evaluation of Quality Records.

Results

No violations or deviations were identified.

8401060317

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. C. Rogers, Project Manager
*L. E. Vincent, Office Engineer
L. R. Davison, Project QA Manager
J. C. Shropshire, QA Engineer Mechanical Welding, NDE
*T. B. Bright, Field Engineer
R. A. Morgan, Sr., QA Engineer
D. H. Llewellyn, Group Leader, Technical Support - Welding
B. Gillespie, QA Welding, NDE

Other licensee employees contacted included construction craftsmen, technicians and office personnel.

NRC Resident Inspectors

P. K. VanDoorn
P. Skinner

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on December 9, 1983, with those persons indicated in paragraph 1 above.

3. Licensee Action on Previous Enforcement Matters

(Closed) Unresolved Item 413/83-44-02, Reactor Vessel Internals Deviation Notice 01838. The licensee provided the inspector the aforementioned deviation notice for review and evaluation. The document was added to the Reactor Vessel Internals Data Package.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Containment (Penetrations) - Observation of Work Activities; Review and Evaluation of Quality Records - Unit 2

This work effort was performed in order to ascertain by direct observation and independent evaluation of work performance, work in progress and completed work, whether activities relative to containment vessel shell plates and penetration sleeves were being accomplished in accordance with NRC/Code requirements and FSAR commitments. The containment vessel was designed, fabricated, constructed and tested in accordance with Subsection NE, Section

III of the ASME Boiler and Pressure Vessel Code, 1971 Edition, including all addenda through the summer of 1972. Design consideration including loads and loading combinations, design and analysis procedure, materials, quality control, and special construction techniques are addressed in paragraphs 3.8.2.3, 3.8.2.4, 3.8.2.5 and 3.8.2.6 of the Catawba Nuclear Station FSAR. Containment vessel shell plate and penetration sleeves were fabricated by Newport News Industrial Corporation under DPC Specification No. CNS-1144.-09-00-0001 with revisions 1 through 6 as applicable. Under requirements of this specification the containment vessel shell plate material was produced from SA-516 Grade 60 material. Penetration sleeves were required to be produced from seamless SA-333 Grade 6 and/or SA-516 Grade 60 material. These materials were specified to meet the requirements of Subsection NE of ASME Boiler and Pressure Vessel Code, Section III. Material for the vertical stiffeners was specified as SA-36 modified flat bar stock. Section 3 of Specification SA-516 Grade 60, stipulates that material supplied to the specification is required to conform to SA-20, which outlines testing requirements, permissible variations in quality and repair of defects. Section 9.3.1 of SA-20 states in part that laminar type discontinuities one inch and less in length visible to the unaided eye on the edges of the plate as prepared for shipment by the manufacturer are acceptable and do not require exploration.

Impact test requirements of paragraph NE-2350 of Code subsection NE were required for all material, except the base liner plate and its embedments.

All welding was specified to be performed by welding procedures and welders qualified under the requirements of Section IX of the ASME Boiler and Pressure Vessel Code. All vendor welds were required to be full penetration groove welds unless otherwise approved by the owner.

Containment shell plate thickness varies according to elevation. Between elevation 550' and 564', plate thickness is approximately one inch and from 564' to 663'-9" plate thickness is approximately 0.75 inches. The hemispherical dome is approximately 0.688 inches thick.

Within these areas the inspector reviewed randomly selected certified mill test reports in order to ascertain whether material thickness, and chemical and mechanical properties met minimum requirements of the aforementioned ASME Specifications SA-516 and SA-20; and whether the impact test requirements of Section III of the ASME Boiler and Pressure Vessel Code were met. Other documents reviewed for reasons stated earlier included vendor weld history records, magnetic particle test results and repair records. Two installed penetrations, 2M-406 and 2M-407, were selected for review of field weld process control records. The review focused on welds 2NI-16-1 and 2NI-15-1, which joined each of the above penetrations to the appropriate 32" diameter containment penetration sleeve. These penetrations were situated parallel to each other at the 557' elevation, in containment shell plate 2-2-6.

The record review of the weld process control records (M-4A) indicated that laminar type indications were found on the weld prepped surface of both containment penetration sleeves. This condition was more prevelant in the case of weld joint 2NI-15-1 and therefore, required additional effort to identify, remove and repair the weld prepped surface to an acceptable condition. Also, the review revealed that following several repairs for fabrication type defects and laminar type discontinuities, both joints were radiographed and found acceptable per ASME Code requirements.

Other penetration sleeves designated as spares by the licensee were observed by the NRC inspector for evidence of laminar discontiniuties. These sleeves were made of 12" diameter schedule 100 material and were identified as follows:

Penetration	Stage of Fabrication
2 POE-227	Tacked
2 POE-239	Tacked
2 POE-241	Complete
2 POE-242	Tacked
2 POE-251	Weld prepped only

The inspector requested and the licensee agreed to perform a magnetic particle inspection on penetration sleeve 2 POE-251 for laminar type indications on the weld prepped surface of the sleeve and none were found.

This inspection effort found that laminar type indications have been identified in the containment vessel shell penetration sleeves. These discontinuities are addressed in the applicable ASME specification which places no minimum requirements/acceptance criteria on their size and/or population except when they appear at the edge of the plate. When this condition appeared the licensee identified it and took appropriate steps to correct the condition, thereby complying with code requirements.

Laminar discontinuities are common in rolled plate material. These discontinuities or laminations are non-metallic inclusions made-up primarily of residues from additions which are made to liquid steel to improve the product by reducing the oxygen content and refining the grain structure. They are progressively elongated longitudinally and spread laterally parallel to the rolled surface to varying degrees, depending on the method of rolling, as the material is rolled into plate or shape. The rolling process used to shape structural steels produces the greatest strength and ductility in the longitudinal and transverse directions which are of utmost importance to structures. However, laminar discontinuities usually reduce ductility of the material in the thru-thickness direction.

Therefore, in that existing and anticipated loads on the Catawba containment produce stresses in the plate, which are parallel to the surface of these discontinuities, their presence would not be expected to compromise the integrity of the containment vessel or endanger the health and safety of the general public.

No deviations or violations were identified.

Office of Inspection and Enforcement

INSPECTORS: Economos

LICENSEE/VENDOR	TRANSACTION TYPE	DOCKET NO. (8 digits) OR LICENSE NO. (BY PRODUCT) (13 digits)	REPORT NO.	SEQ	NEXT INSPEC. DATE MO	YR
DPC	✓ I – INSERT	50000413	8353	A		
	M – MODIFY	50000414	8340	B		
	D – DELETE			C		
	R – REPLACE			D		

PERIOD OF INVESTIGATION/INSPECTION FROM (MO DAY YR)	TO (MO DAY YR)	INSPECTION PERFORMED BY	ORGANIZATION CODE OF REGION/HQ CONDUCTING ACTIVITY (See IEMC 0530 "Manpower Reporting—Weekly Manpower Reporting" for code)
12 06 83	12 09 83	✓ 1 – REGIONAL OFFICE STAFF; 2 – RESIDENT INSPECTOR; 3 – PERFORMANCE APPRAISAL TEAM; OTHER	REGION: II; DIVISION: C; BRANCH: A

REGIONAL ACTION (Check one box only)
- 1 – NRC FORM 591
- X 2 – REGIONAL OFFICE LETTER

TYPE OF ACTIVITY CONDUCTED (Check one box only)
- ✓ 02 – SAFETY
- 03 – INCIDENT
- 04 – ENFORCEMENT
- 05 – MGMT. AUDIT
- 06 – MGMT. VISIT
- 07 – SPECIAL
- 08 – VENDOR
- 09 – MAT. ACCT.
- 10 – PLANT SEC.
- 11 – INVENT. VER.
- 12 – SHIPMENT/EXPORT
- 13 – IMPORT
- 14 – INQUIRY
- 15 – INVESTIGATION

INSPECTION/INVESTIGATION FINDINGS (Check one box only): A ✓, B ✓
- 1 – CLEAR
- 2 – VIOLATION
- 3 – DEVIATION
- 4 – VIOLATION & DEVIATION

TOTAL NUMBER OF VIOLATIONS AND DEVIATIONS: A 0, B 0, C 0, D 0 (0.000)

ENFORCEMENT CONFERENCE HELD: 1 – YES

REPORT CONTAIN 2.790 INFORMATION: A ✓, B ✓; 1 – YES

LETTER OR REPORT TRANSMITTAL DATE
- NRC FORM 591 OR REG. LETTER ISSUED: MO 12 DAY 21 YR 83
- REPORT SENT TO HQ FOR ACTION: MO DAY YR

MODULE INFORMATION

TYPE	NUMBER	PHASE	MANUAL CHAPTER	PROCEDURE NUMBER	LEVEL	SEQ	PRIORITY	DIRECT INSPECTION EFFORT IN STAFF HOURS EXPENDED THIS INSPECTION	PERCENTAGE COMPLETED TO DATE	STATUS	FOLLOWUP PHASE	FOLLOWUP MANUAL CHAPTER	FOLLOWUP PROCEDURE NUMBER	FOLLOWUP LEVEL
		2	53	053	B	A	1	34.0		P				
						B	1	00.0						
						C								
						D								
		2	30	703	B	A	1	01.0						
						B	1	00.0						
						C								
						D								
		2	92	701	B	A	1	01.0			2	55	903	B
						B	1	00.0						
						C								
						D								
						A								
						B								
						C								
						D								

● CIRCLE SEQUENCE IF VIOLATION OR DEVIATION

50-413 Catawba G. Hesselt / / .

Facility Name Project Inspector PI's Initials Date Acknowledged

ITEM NUMBER	TYPE	MODULE #	AREA	RESP.	ACTION DUE DATE	CLOSEOUT ACTION
83-44-02	UNR					83-53-C

DESCRIPTIVE TITLE

ITEM NUMBER	TYPE	MODULE #	AREA	RESP.	ACTION DUE DATE	CLOSEOUT ACTION

DESCRIPTIVE TITLE

ITEM NUMBER	TYPE	MODULE #	AREA	RESP.	ACTION DUE DATE	CLOSEOUT ACTION

DESCRIPTIVE TITLE

ITEM NUMBER	TYPE	MODULE #	AREA	RESP.	ACTION DUE DATE	CLOSEOUT ACTION

DESCRIPTIVE TITLE

Information entered by MIS on __/__/__ by _____

Date Initials