

April 10, 1970

██████████ Reactor Inspector  
Region II, Division of Compliance

INSPECTOR'S EVALUATION AND OPINION - GEORGIA POWER COMPANY (HATCH),  
LICENSE NO. CPPR-65, DOCKET NO. 50-321

This memorandum refers to CO Report No. 50-321/70-2.

Georgia Power Company (GPC) has a greater number of quality control personnel at the Hatch site than most licensees and appear to have a working system or recordkeeping; however, the qualifications of the field inspectors are questionable as demonstrated by leading questions submitted by the inspector to the Hatch inspectors and their supervision. A case in point is the code requirement for machining or grinding after thermal cutting in order to perform a meaningful dye penetrant or magnetic particle examination. This is a standard requirement with boilermakers on Section VIII work, but is disregarded by many since it does slow up production.

Staffa and Miles attempted to "brush this item off" and Benagas, Bohanan and the PTL inspector were unaware of the above requirement.

The inspector attempted to catch CB&I in this violation on the suppression chamber and was advised by Benagas and one of the weldors that an oxy-acetylene cut on cam No. 10 would be welded on the next operation; however, the visit was terminated before this weld was accomplished.

The inspector witnessed no mag particle or dye penetrant examination.

Discrepancies observed were alleged to be "pickup" points, even an inexcusable one in which a weldor on the torus welded over a stub of bracket which was immediately adjacent to the main horizontal joint. This is a code violation.

QA and QC management at Hatch has failed to review with the field inspectors the salient requirements of ASME Section VIII.

*MINE*  
*See Vergil's last page*

*see attached*

8002110

532

A10  
F

Attachment 6

April 10, 1970

Staffa, GPC's QA Director, continually defends anything in the nature of a discrepancy instead of calmly assessing the discrepancy in relation to the applicable codes.

It is this attitude that prohibited GPC from advising Region II of a serious incident and, where it not for the accidental discovery by Region II, the \$20,000 injury to the knuckle section of the containment would have been incorrectly repaired as evidenced by the GPC and CB&I reports of the incident and incorrect repair procedures. The question remains, how many other similar incidents in the past have been overlooked?

J. M. Varela

Reactor Inspector (Construction)

CO:II:JMV:wb

*Georgia Power & CBI Quality Control were aware of the serious damage to the knuckle section. No one notified the Code Inspector or the AEC, instead clandestinely allowed an improper and illegal repair, hoping that the Commission would not know of it and thus save considerable time and money.*

Virginia Polytechnic Institute (Argonaut)  
License No. R-01, Docket no. 50-124

██████████ conducted a routine inspection of the facility on April 16-17, 1970. There were no items of noncompliance or safety significance. The facility is now being operated on a more regular basis and the inspector reports a significant improvement in management and supervision. Considerable unrest among students and other demonstrators was observed at the time of the inspection. However, the reactor supervisor, Dr. A. Robeson, indicated that no risk to the facility is involved.

GEORGIA POWER WATER REACTORS UNDER CONSTRUCTION

Georgia Power Company (E. I. Hatch No. 1)  
License No. GPR-02, Docket No. 50-321

██████████ and J. H. Varela conducted an announced inspection on March 23-25, 1970. ██████████ and ██████████ continued the inspection at the licensee's general offices, Atlanta, on March 26. The inspection efforts were directed at completing the requirements of PI 4600 (Concreting), Attachment C - PI 4800 (Welding) and PI 5400 (Structures), Attachment F - PI 4800 (Welding) and PI 5000 (Piping), Attachment G - PI 4300 (Welding) and PI 5000 (Piping), Attachment L - PI 4900 (Pumps and Valves) to meet the requirements of PI 3900/2. The licensee's quality assurance/quality control program is functioning well as an overall program; however, a CDN will be issued for a weakness in the site quality control program in that a major welding repair was performed on the transition course (knuckle section), which is a stress relieved portion of the drywell structure, prior to approval of a "Special Repair Procedure" and the concurrence of the code inspector. There is some question of specific code requirement for this welding repair. The licensee maintains that wire brushing of the repair area satisfies code. A better practice is grinding rather than brushing and the Region II construction inspector maintains that the code requires grinding. This matter of code requirement will be referred to Regulatory Headquarters for resolution.

See page 2/18  
14/161  
13/SCOPE

This assignment is for the purpose of evaluation the licensee's construction program and performance as delineated in Pl 3800/2; specifically, Section IV, welding (4800) of the containment.

The EWR containment for Hatch is being fabricated into subassemblies (Exhibit A, Photos 3, 4, & 12). From the number of assemblies completed it appears that installation will be starting before the end of the year.

Significant Items

1. Refer to Details Section (04.b.(4)). Also see Exhibit D-2. The inspection record

(CB) Form 500 only requires the inspector's initial. The record is filled out by Benegas a weldor and he refers to Douglas McCusker as the person who tested the weld. Who is the inspector? Also, the final status of the weldment, according to the data noted is not conclusive.

2. Refer to details, Section (04.e.(1)) and (05.3(b)). Only one man determines acceptability of radiography. All determinations to date were performed without concurrence of the licensee or his representative.

3. Refer to Section (04.f.(2)) and (05.4.(a))

Defect removal verification is inconclusive and do not follow the CHI procedure.

4. Refer to Section (05.3.(c))

The Containment Vessel report (Form 500) does not address itself to plate defects resulting from arc strikes etc.

A10  
G

Attachment 7

5. Refer to Section (05.4.(6))

Heat treatment is conducted and inspected by the individual welders and is not recorded.

6. Refer to Sections (05.5.a,b,&c)

The contractor does not record information relative to welding material control.

7. Refer to Section 4805.06

The contractor is not following his specification GWS 900B, paragraph 7.4.5 on color coding examination status and 7.4.6 on repair of defects.

8. Refer to Section (06.a.(4))

Inspection of a 20ft. long weldment that was completed, repaired and inspected showed additional defects.

9. Analysis of the Licensee's QC Program - Refer to Section (4805.06.b(3))

This treatise discloses that the licensee is buying QC and is unfamiliar with the management and execution of a program that will assure him conformance with the terms of the contract.

10. The contractor is making procedure changes without concurrence of the customer (Licensee). (See Exhibit E.)

NON CONFORMANCE  
NON CONFORMANCE

1.0.6 Preheating for fillet welds for both permanent and temporary attachments shall be 200°F minimum without regard to ambient temperature when the plate thickness of the Dry Well shell plate exceeds 1-1/8". This preheat shall be applied to the plate surfaces within six inches of the point where welding is to be performed.

1.0.7 Preheat for tacking, fitting and pick-up welding is not required when the ambient temperature is 50°F or higher and the thickness of the Dry Well shell plate is 1-1/8" or less. If the ambient temperature is below 50°F, a preheat warm to the hand (100°F minimum) is required.

1.0.8 When tacking, fitting-up, or pick-up welding is performed on Dry Well shell plates greater than 1-1/8" in thickness the plate material in the area where the weld is to be made shall be at a temperature warm to the hand (100°F minimum) regardless of the ambient temperature before the weld is made.

#### E. Nondestructive Testing

##### \*e.1. Radiograph Quality

This is a 'one man show' with Glen Holloway of CB&I in full and only control.

The recording is noted on Form 500 but it is a "go" and "no go" approach.

*Refer to 4805.05 36 for further details*

##### e.2. Evaluation of Weld Quality From Radiograph

Same as preceding

##### e.3. Magnetic Particle Examination

Both forms No. 500 and WLD-21 indicate a documentation of this examination.

##### e.4. Dye Penetrant Examination

Confirmed on Forms WLD-21 and No. 500

e.5. Ultrasonic Examination

DNA

e.6. Correlation of Record to Specific Weld

This operation is reflected on Form WLD-21 under columns, Description of Weld to be Examined, Examination, and Report No. <sup>and</sup> Source of Requirement.

F. Repair of Defects

f.2. Defect Removal Verification

The CB&I Procedure GWS-900B addresses itself in paragraph 10 to weld Examination and paragraph 11 to Repair of Weld Defects and states "Documentation of repairs shall be in accordance with the applicable QA Program. There is no positive approach to defect removal verification only that a defect is noted and corrected.

The writer believes that something like a "punch list" should be posted daily or periodically and that the welder responsible should be identified. Also, progressive drawings should be maintained showing weldments, NDT, repairs, following NDT and a final "all green" indicating final inspection and acceptance. CB&I procedure RTP-2B shows Form GE4 indicates seam and piece mark, location and size of defect, type of defect, no. of inspections and reshot No. and the name of the welder; however, CB&I were not following this procedure to the letter.

f.6. Acceptance of Repair

This act is noted on the Form WLD-21 and it requires the signature of the QC Supervisor CB&I's welding QA procedure (unidentified) paragraph 7.4.6 states:

Whenever defects requiring repair or subsequent further evaluation are found, the defects are marked with "Repair" or a red sticker "Repair Required" and arrows or other means as necessary

to indicate extent of defects. Such defects will be shown on the "List of Repairs", referenced in the report column of the "Field Examination Check List", and signed off when the repair has been completed. Using this system, exact location of nonconformities need be retained only until such time as the repair has been made or the part replaced.

*Compliance*

No such evidence was observed by ~~SA~~ <sup>4</sup> who observed over 100 defects.

4805.05 Record Review

Chicago Bridge and Iron was in the process of pre-fabrication of the containment vessel. On a sampling basis the following records were reviewed and the results are indicated.

3.a. Radiograph Quality

The inspector viewed 37 radiographs of the containment bottom head. The radiograph quality was as follows: The 2T penetrameter hole, the penetrameter outline and identifying numbers were clearly visible. Using a densitometer <sup>determined that</sup> the inspector <sup>A</sup> the film density to be approximately 2.0 of four films inspected. The specification RTP-2B range for density is 1.7 to 2.5. The films were generally free from chemical and mechanical defects.

3.b. Evaluation of Weld Quality From The Radiograph

The CO inspector took issue with only one interpretation. The reviewer claimed that Assy. 7 to 47, film 2 to 3, was scratched. The CO ~~xxxx~~ inspector could not find the scratch on the film which when projected showed a discontinuity. The CO inspector asked F. Dutton of CB&I, S. Tucker and others present to inspect the film and try to find the "scratch". No one was ~~xxx~~ able to do so and Dutton ordered a reshot of this area of weldment.

3.c. Magnetic Particle Examination

The containment Vessel Form 500 (Exhibit D-2) and the Field Examination Check List Form WLD-21 indicate "some" recording of this method of examination.



4.d. Qualification of Welder

The contractor maintains a list of the weldors and their qualifications; the fabrication reports do not state whether the weldor is qualified or not and this inspector (CO) does not consider this to be a requirement.

4.e. Test Treatment

The fabricators records do not verify or address themselves to this process. Each weldor has a "Tempil Stick" and checks his own work piece for temperature and no one records this information. The CB&I Specification GWS 900B, paragraph 0.4, Monitoring, states:

"Joints requiring preheat will be checked before welding of the joint is started to ascertain that the minimum preheat temperature has been reached.

Periodic checks will be made while welding is in progress to insure that the required minimum temperature is being maintained.

Temperature indicating crayons will normally be used to determine that the joint is at the required minimum temperature or above.

4.f. Acceptance of Repair

Remarks in 04.4 a & b apply to this function

5.0 Records of Welding Material Control

5.a. Issue Control

Exhibit D-2 indicates that the electrode ovens were inspected at 8:30 a.m., 11:00 a.m., 1:30 p.m. and 3:30 p.m. Records are lacking in the identification, issue and disposition of unused material.

5.b. Post Issue Control

5.c. Disposition of unused Material

4805.06 - C. Observation of Work Performance

Fabrication of containment subassemblies was in progress. Observations are as follows:

a.1. Availability and use of prescribed procedures for weld performance, including identification of Weld Type and Material

CB&I does not conform to to paragraph 7.4.5 of their specification (unidentified) which states:

"Color codes adhesive tape or other marking means are to be used during each field examination, except 100% radiography, to indicate inspection status of item, seam or component. The non-destructive x testing operator will mark "MT OK" or "PT OK", an arrow at the start of the examination and a reversed arrow at the conclusion of the examination. For the examination of seams, a line shall mark stops and starts as follows:

Small attachment can be signed off with "MT OK" or "PT OK" without arrows.

CB&I does not conform to its procedure paragraph 7.4.6 which states:

"Whenever defects requiring repair or subsequent further evaluation are found, the defects are marked with "Repair" or a red sticker "Repair Required" and arrows or other means as necessary to indicate extent of defects. Such defects will be shown on the "List of Repairs", referenced in the report column of the "Field Examination ~~Check List~~ List", and x signed off when the repair has been completed. Using this system, exact location of nonconformities need be retained only until such time as the repair has been made or the part replaced."

CB&I does not conform x with their procedure xxx para. 6.1.1 which states, "Each layer of welding shall be smooth and free of slag".

Welders were x observed attempting to "boil out" the slag rather than mechanically remove the slag. *Spec. GWS-900B para 1.0.2 states "All slag shall be removed from each bead of welding prior to depositing the next bead."*  
a.3 Identification of weld, location, Weldor and Inspector

This was satisfactorily demonstrated.

a.4. Physical Appearance of Partially Completed and Completed Welds

- (a) Burn thru - There was no evidence of burn thru
- (b) - Cracks: - A crack was observed which was overlooked and only partially ground out on PcMk 302 - HR to 302 - D shown on exhibit. A
- (c) - No porosity was observed on finished and acceptable weldments
- (d) - Undercut: Undercut was observed on an accepted weldment of the suppression chamber shown on exhibit. A
- (e) - Weld Profile: - Weld profile by weldor (HDK) was not acceptable according to AWS welding Inspection, page 88 in that the weldment indicated spatter and undercut resulting from excessive high amperage.
- (f) - Presence of Arc Strikes and weld spatter on Adjacent & Surfaces  
(See Photo No. 10 - Repaired and inspected welding contained and un-repaired inspected arc strikes.

additional

a.5. Identification, handling, and control of weld materials.

This operation was found to be satisfactory

b.1. Weld repair including (See Exhibit A, Photo 9)

- (a) - Method of Removal was found to be incomplete.  
*of plate defects was*
- (b) - Verification - Verification <sup>inadequate</sup> ~~inadequate~~, since partial removal of <sup>"pick-ups" were superficially</sup> ~~defects prevented extent of defect.~~ *ground out leaving defects which were disregarded*

(c) - Conformance to Reweld Procedure (See Exhibit A, Photo No. 11)

The CO inspector directed attention to <sup>an</sup> inspected weldment and adjacent gouges, undercut, and a crack on plate material where a temporary attachment was much mechanically removed and only partially ground out.

It was subsequently discovered by check that HDK had welded over on lines of plate material on forming. He was found to be

b.2. Availability and Use of Prescribed Procedures and Performance of

QC inspections for NDT

CB&I specification No. 69-4153 for the Edwin I Hatch Nuclear Station includes Radiographic Examination Procedure RTP-2B, Liquid Penetrant Examination Procedure PTP-2B and Magnetic Particle Examination Procedure MTP-5B.

These procedures reference the following:

- ASME Boiler and Pressure Vessel Code, Section III, Nuclear Vessels Subsection B, 1968 Edition and Winter Addenda 1968
- ASME Boiler and Pressure Vessel Code, Section VIII, Pressure Vessels, Division 1, 1968 Edition and Winter Addenda 1968
- ASME Boiler and Pressure Vessel Code, Section IX, Welding Qualifications, 1968 Edition and Winter Addenda 1968.

0.3 CONTENT

Included in this ~~xxx~~ specification are the following:

General

- Attachment "A" — List of Welding Procedure Qualifications
- Attachment "B" — Preheat Requirements
  - Part I Preheat Requirements for Dry Well
  - Part II Preheat Requirements for Suppression Chamber
  - \* Part III Preheat Requirements for personnel Locks & Hatches
- Supplement I — General Welding Procedure; E7018
- Supplement II — General Procedure for Welding Wide Gaps

~~NOTE: Listing corrected 7/16/69 to add Part III.~~

The writer considers the procedures adequate but considers the performance of QC inspections inadequate. The performance is inadequate because, there is

*no evidence*

~~little indication of~~ progressive, programmed controlled supervised inspections;

The writer toured the containment pre-fab area in the company of CB&I and Georgia Power personnel on three occasions and spent considerable time looking at welding ~~x~~ in progress, completed weldments and repaired weldments and every time this inspector pointed to a weld defect that was not circled or in some manner "flagged", he was told that the particular

subassembly had not ~~x~~ received final inspection. In some cases where "flagging (with crayon) was done, there were additional defects undetected and to summarize, there was little ~~x~~ evidence that defects requiring NDT were inspected except for <sup>notations on</sup> the welding check-off list which did not correlate with the weldment 100% i.e., there were defects other than those recorded and some of the defects were not "flagged" for NDT.

B.3. Analysis of the Licensee's QC Program

From the preceding observations it <sup>appears</sup> ~~appears~~ that Georgia Power is delegating or buying quality control. On the last day of the inspection the writer asked Mr. Miles, Frank Dutton and Compliance inspector Upright to step outside of the CB&I inspection trailer for the purpose of a discussion on observations delineated in the foregoing report. The somewhat private atmosphere was desirable ~~xx~~ since there were weldors and inspectors in the trailer that might resent an expose' of their day's activities as seen thru the eyes of the AEC.

I told Mr. Miles that I wanted to assure myself that I had the correct interpretation of the relationship between the 'people' constructing Hatch. After reviewing some of the salient observations, I said to Miles, "I am attempting to analyze your philosophy on the construction of the

containment". Without hesitation, Miles state, "We hired the best vessel manufacturer in the country and we are buying their quality control." This quote identifies a problem area and indicates the failure in execution of the Georgia Power QA program, and based upon observation in other activities, in particular the concrete operation which disclosed gross negligence in the delivery of a  $\pi$  4 cubic yard mix which did not contain water and which the crew attempted to vibrate into the preceding load, thus compounding the violation, it is evident that the GP site QC does not understand its function. GP has all the tools of the "Trade" but one, and that is the most essential, it has no experience in field construction that demands verification, assurance, proof and a programmed way of life for the site force.

The GPC site management maintains a daily log but its reporting merely notes progress and is oblivious of details.

The inspectors of GP, CB&I, Pittsburgh Testing and the Standard Construction Company do not have a program for their days activities. <sup>The program</sup> ~~The program~~ must be an inspection point program but so devised that "tunnel vision" is eliminated. The days activities as reflected in the daily report must not be a check list it must demand in depth observation ~~and~~ including important conversations with other organizations involved. An example of a laxity is the problems which K. Gillespie (GPC) was having with CB&I. Gillespie stated, "that CB&I supervision was giving him a hard time" and that "CB&I was ignoring his complaints on improper work performance."

This situation should have been resolved immediately by top management instead of the continued disregard which resulted in Gillespie's feeling of helplessness.

THE WRITER OBSERVED WELDING IN PROGRESS OVER A PREVIOUS PASS WHICH CONTAINED A SMALL AMOUNT OF SLAG. REFERENCE OF THIS OBSERVATION TO INSPECTOR McLAUGHLIN RESULTED IN HIS SUBMISSION OF HIS <sup>run-head</sup> ~~When the writer observed welding deposited over a previously~~

~~which did not have all the slag removed, the condition was investigated and on a PTL report #9 dated September 12, Item #7~~ <sup>which</sup> stated "Three welders were observed not to clean the slag from their craters prior to further deposition."

First of all GPC was not aware of this problem, secondly, craters should be <sup>avoided</sup> ~~avoided~~ by training the QUALIFIED weldor to withdraw the electrode slowly and thus filling the crater with metal or by using foot control on the welding machine current. (See Welding Metallurgy AWS page 235 on Crater Cracks in Weld Metal.) Compliance discovered the foregoing condition in a matter of hours, in contrast to the unawareness of the licensee of these and other deficiencies which have existed throughout their residency. To return to the programming of an inspector's activities—it is not enough to daily report problem areas, they must be "logged" in a manner to give VISIBILITY.

This can be done in ~~xxxx~~ many ways. The writer used isometrics of piping systems. They were displayed on the walls of the inspection office and the ~~xxxx~~ inspector noted in detail the weld <sup>status</sup> ~~as shown on the drawings~~, the 'cut shorts', cold spring, as-bults hangers, testing etc., in a progressive manner. The vessel fabricating progress and inspection was followed on a "roll-out" drawing which also was mounted on the inspection walls, and the assigned inspector kept the visibility current and ~~xxx~~ his daily reports were kept in a "vessel" ~~xxxx~~ folder, *where for ease of retrieval and as a check against the "roll out"* It is the responsibility of the site QC manager to see that the visibility is current, correct, and that corrective action is taken in time.

The foregoing may be delegated ~~x~~ but the licensee must be fully aware.

The quality Assurance Manual can be perfect from the stand point of its aims but ~~the~~ execution requires experience. Much has been written about the <sup>his hands</sup> ~~manufacture of concrete~~ but unless one has had ~~his hands~~ in the "mud" you cannot predict the outcome.