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MAY 15 1986

MEMORANDUM FOR: Jose A. Calvo, Manager
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FROM: E. B. Tomlinson, Leader
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Systems/Operational Group, Comanche Peak Project

SUBJECT: REPORT OF SITE AUDIT OF CPRT SELF-INITIATED CONSTRUCTION ADEQUACY PROGRAM - OCTOBER 1985

During October, 1935, the staff conducted an audit of the CPRT Self-Initiated Construction Adequacy Program. This program is detailed in ISAP VII.c of the CPRT Program Plan.

The audit was conducted in three phases spanning the month of October, 1985, as follows: October 14-18, October 21-25, and October 28-31. The audit was conducted by a group comprised of NRR staff personnel and selected consultants. The audit participants are listed in the attached Appendix A of this report. The staff and consultants are hereinafter referred to as "the audit team."

The audit was conducted with two primary objectives in mind. The first was to fully understand the methodology that ERC will utilize in developing and implementing the program. The second objective was to determine if ERC was providing a clear, auditable trail of program activities commencing with program development and continuing through implementation and final reports. With this in mind, the audit team concentrated on the major areas of population definition, the basis for population homogeneity, development of work processes and attributes, development of population lists, random sampling, and documentation for these areas.

Details of specific audits covering all disciplines and a portion of the total populations are included in Appendix A of this report. It was not intended to address the technical adequacy of the program during this audit as this is

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considered part of the program implementation. A detailed audit for technical adequacy will be conducted at a later date.

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APPENDIX A

Report of Site Audit

of

CPRT Self-Initiated Construction Adequacy Program

October 1985

1. Audit Participants

NRC
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E. Marinos
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E. Tomlinson

Consultants

P. Chan	LLNL
M. Yost	EG&G
J. Flaherty	TES
J. Rivard	TES
J. Nevshemal	Westec
B. Saffell	Battelle-Columbus
R. Masterson	EAS
R. Philleo	

Applicant Personnel Contacted
B. Shair, ERC
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J. Warrington, ERC
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V. Hoffman, ERC (SWEC)
W. Bailey, ERC
J. Beck, TUEC

2. CPRT Construction Reinspection/Documentation Review Program

The object of the program is to verify the adequacy of the construction, and to gain additional insight of the quality of the plant. The program consists of establishing a comprehensive method of reinspection and verification independent of the applicant's authority.

Audits of the Comanche Peak Response Team (CPRT) Construction Reinspection/ Documentation Review Program (ISAP VII.c), subsequently referred to as the Construction Adequacy Program, were conducted on October 14-18, 21-25, and 28-31, 1985, at the Comanche Peak Steam Electric Station site. All disciplines--mechanical, civil/structural, electrical and instrumentation and control--were audited by teams composed of NRC staff and consultants. Through these audits, the NRC reviewed the basis for establishment of the populations within each discipline and the work processes associated with each population and utilized by the CPRT for assessment of construction adequacy. The audits were conducted to determine that (1) the bases for establishing populations within a discipline were sound, (2) homogeneity within each population was established, and (3) to determine if there was an auditable trail covering all of ERC's efforts in the program.

The construction adequacy review program is being performed within the purview of the Comanche Peak Response Team with ERC, Inc., responsible for performing the review. The presentation made by Mr. John Hansel of ERC, Inc., at a public meeting held on October 3 and 4, 1985, in Grandbury, Texas, provided the basis for the staff's initial audit of the CPRT Construction Adequacy Program.

Work processes are being identified which reflect construction of safety related systems, components, and supports. Each work process will be evaluated by a random sample drawn from the associated population of systems, components, or supports related to that work process. Further, sample items reviewed are drawn from Unit 1, Unit 2, and common areas, and must be

construction complete and accepted. Each work process sample is expanded to include an engineered sample. The engineered sample assures that a number of safe shutdown system items equivalent to the number of items addressed by the random sample are also reviewed for adequacy of construction. The selection of random samples in discussed in Section 6 of this Appendix.

Subsequent sections describe the NRC audits of the above process.

3. Electrical and Instrumentation Discipline

The electrical and instrumentation discipline is subdivided into five populations as follows:

(a) Instrumentation Equipment
(b) Cable Tray
(c) Electrical Equipment
(d) Conduit
(e) Cable

Work processes with associated reinspection attributes were established for each population. This provided the basis for a uniform approach to verification without omitting any major characteristics common to the group.

The Construction Adequacy Program Review for the electrical populations is only addressing construction complete items and only includes construction activities. Vendor fabrication is not within the scope of the Construction Adequacy Program. For each of the electrical areas, ERC provided a "Population Description" which addressed the contents of each population and how the population boundaries were established. In addition to the "Population Descriptions," ERC also provided a flow chart describing the work processes associated with construction activities within each population. This

flow chart contained attributes associated with each work process. ERC indicated these attributes will provide the basis for the checklists which are being developed for re-inspection of electrical systems and components.

ERC reported that the construction adequacy review is being performed in accordance with their own quality assurance program.

(a) Instrumentation Equipment. The selection of the work processes was reviewed for homogeneity and comprehensiveness. The attreibutes for each work process were also reviewed.

The instrumentation equipment population is divided into two work processes, and the attributes for each process are as follows:

i. Tubing/Piping and Component Installation: attributes - Material Identification, Tubing Size & Marking, Routing, Slope, Air Gap, Separation, System Bends, and Flex Hose Installation.

ii. Instrument Installation: attributes - Idetnfication, Location, Installation, Separation, and Damage.

The NRC staff and consultants discussed each work process and attribute with the ERC personnel. The auditors discussed how each work process and attribute was derived, and reviewed the rationale behind ERC's consideration with respect to the adequacy of the work process and attributes.

An instrumentation equipment population item list was made listing all 1024 population items in Unit 1, Unit 2, and common areas. These items were all safety related, and they were listed with their respective instrument tag numbers and flow diagram numbers. This constituted the total population from which instrumentation equipment samples will be selected. A random number will be generated for each population item in the list, and a random sample of 60 items will be selected for reinspection and analysis. This sample will

contain items only from Unit 1 and the common areas. None of the items from Unit 2 will be included as Unit 2 is under construction and the Unit 2 items were not completed or accepted. If the initial sample of 60 items does not include 60 items related to safe shutdown, additional items will be selected until a total of 60 items related to safe shutdown have been selected. It is anticipated that this procedure will result in an average of about 95-100 items being selected for reinspection for each population.

(b) Cable Tray

This population has one work process: cable tray installation. The work process is supported by the following attributes: Identification and color code, No damage, Configuration (Tray size, Routing, Attachments, Welding, Rung spacing, and Bolting), Clearance, Fire stops, and Separation criteria. One of these attributes, welding, has 12 contributing sub-attributes.

There are 5311 sections of cable tray in the population. Brown and Root's Electrical Group is responsible for the supervision of cable tray installations, with its craftspersons performing the actual installation. The installation was performed employing: Gibbs and Hill specifications and procedures, Brown and Root procedures, and TUGCO Quality Instructions.

During the audit the work process and attributes were discussed and evaluated to determine how each was derived and approved by ERC. The auditors also reviewed the method to be used in the sample selection process where a sample of 60 safety related items will be selected.

(c) Electrical Equipment

The electrical equipment population is made up of two work processes with several supporting attributes. The two work processes are: (1) electrical equipment installation, and (2) field assembly and field modifications. The population includes electrical equipment of various sizes and unique configurations such as electrical penetrations. Documentation used in the installation of this equipment are Gibbs and Hill procedures and specifications, Brown and Root installation procedures, and TUGCO quality instruction procedures. Brown and Root's Electrical Group is responsible for the supervision of electrical equipment installation and Brown and Root's electricians perform the actual equipment installation.

The above work processes, attributes, and documentation were discussed with EPC during the audit. It appears that the electrical equipment installation was performed to the above specification and procedures in the same manner as the other electrical populations. The sampling process is the same as for the previously described electrical populations.

(d) Conduit

This population has three work processes with the following supporting attributes:

i. Selection attributes: Size/Material

ii. Preparation attributes: Conduit/Fabrication, Cutting, De-burring, and Repair

iii. Installation attributes: Identification, Origin/Destination, Fittings, Bends, Pull points, Flexible conduit, Interface (tray), Clearance, Fire stops and seals, and Separation.

The work processes apply to both rigid and flex conduit. The conduit was installed to Brown and Root specification and procedures. The above work processes, attributes, and documentation were discussed with ERC during the audit. It appears that the conduit population installation was performed to the Brown and Root specification and procedures in the same manner as the other electrical populations. Also, the sampling process is the same as for the other electrical population.

(e) Cable

This population has three work processes with the following supporting attributes:

i. Prepull attributes: Size, Type, Color, Defects, and Raceway.

ii. Pull attributes: Lubricant, Routing, Bend radius, Spacing, Slack, Pull tension, Separation, Damage, and Repair.

iii. Terminate attributes: Identification, Testing, Insulation, Conductors, Terminals, Hardware, Landings, Heat Shrink, and Secure.

These three work processes encompass cables of all sizes. During the audit several documents were reviewed and evaluated, which include Gibbs and Hill procedures and specifications, Brown and Root procedures, and TUGCO quality instructions. The Brown and Root construction management organization has been responsible for all cable installation work processes since the beginning of construction work.

Each work process and attribute was discussed and evaluated, with respect to the above documentation, to determine how each was derived and considered adequate by ERC. Also discussed was the sampling process and how the 60 safe shutdown samples were selected to achieve a reasonably homogeneous population. The staff was concerned that the third work

process, "Terminations," and its associated attributes represented too broad a scope. It was the staff's position that there was a significant difference in the terminations for various types of cables and that these differences would undermine population homogeneity within this work process. Consequently, total reinspections resulting from combined random and engineered samples would not provide an adequate basis for inferring that all cable terminations in the plant were (or were not) acceptable. To address this concern, it was agreed to clarify the attributes under this work process to specifically address all types of terminations. This clarification will result in an increased number of attributes which will effectively represent sub-groups of the single work process. The sample size will be increased, as required, to ensure an adequate number of reinspections within each of these sub-groups. With these modifications to the work process, the homogeneity within the cable population will be maintained.

4. Mechanical Discipline

The mechanical discipline is divided into nine populations which are:

(a) HVAC ducts and plenums
(b) HVAC equipment installation
(c) Field fabricated tanks
(d) Mechanical equipment installation
(e) Large bore piping configuration
(f) Small bore piping configuration
(g) Pipe-welds/material
(h) Piping system bolted joints/material.

Each of these populations was discussed with ERC personnel by NRC staff and consultants participating in the audit. Only field construction work processes are addressed by the scope of this activity; vendor fabrication is not within the scope of the Construction Adequacy Program. For each of the mechanical areas, ERC had prepared a "Population Description' addressing the

contents of each category, its boundary, and any specific interfaces germane to the population. In addition to the Population Descriptions, a flow chart describing the work processes and associated attributes for each sample population was provided and discussed with ERC's Population Engineers. ERC indicated that these attributes provide the basis for the checklists which are being developed for reinspection of mechanical systems and components.

ERC reported that the construction adequacy review is being performed in accordance with their own quality assurance program.

Specific commetns on each population within the mechanical discipline are provided in the subsequent paragraphs.

(a) HVAC Ducts and Plenums. This population contains all passive equipment in the safety-related HVAC system whereas the HVAC equipment population contains only active items. The HVAC Duct and Plenum population encompasses 6800 items. Fabrication, installation and welding are the three work processes associated with construction of HVAC ducts and plenums. Reasonable homogeneity is established because the population is limited to work done by a single sub-contractor, the work processes are covered by the same specifications, and the work processes are reasonably common to all equipment within the population, except as noted below. The attributes associated with each work process were reviewed and appeared to be complete.

The HVAC Ducts and Plenums population has been modified based on a concern raised during the audit. The work process for Equipment Setting by Brown & Root has been deleted and will be combined with the mechanical equipment installation (MEIN) population since the same Brown & Root procedures and installation specifications were used.

(b) HVAC Equipment Installation. This population contains 604 items of active equipment in the safety-related HVAC system whereas the HVAC Ducts & Plenums population contains only passive items. The work processes associated with HVAC equipment installation are the setting of the equipment and then connecting it to the plenum and ductwork. Reasonable homogeneity is established because the population is limited to work done by a single sub-contractor, the work processes are covered by the same specifications, and the work processes are reasonably common to all equipment within the population, except as noted below. The attributes associated with the work processes were reviewed and appeared appropriate for the process.

This population has been modified based on a concern raised during the audit. The work process for Equipment Setting by Brown & Root has been deleted and will be combined with the MEIN population since the same Brown & Root installation procedures and specifications were used.

(c) Field Fabricated Tanks. This particular activity was discussed in a qualitative manner. ERC informed the audit team that eight field fabricated tanks exist and that all would be reinspected. This was not pursued further as population homogeneity was not an issue because of the 100 percent reinspection.

(d) Mechanical Equipment Installation. The mechanical equipment installation population encompasses 336 items. The governing construction document is the Gibbs & Hill Mechanical Erection Specification 2323-MS-101. The implementation of this is accomplished by Brown & Root Specification titled "General Installation of Mechanical Equipment", MCP-1. The work processes associated with mechanical equipment installation are setting, anchoring, welding and, for rotating equipment only, alignment. The attributes of each work process were discussed in depth.

There are currently two work processes being reviewed. The welding work process will be deleted from the MEIN population and put in the appropriate pipe weld work process. ERC is also reviewing the deletion of grout from the attribute list and considering establishing a new population that specifically addresses grout. This change is due primarily to the way documentation was established.

Construction specifications and installation procedures for six items of equipment within this population were reviewed for compatibility with the attributes associated with the work processes. Compatibility did appear to exist between the work process attributes and equipment installation procedures in all cases.

(e/f) Large Bore Piping Configuration/Small Bore Piping Configuration.

The large and small bore piping configuration populations are based on 3000 Brown & Root isometric drawings. The scope of this activity is intended to assess the work process of piping installation through evaluation of attributes such as location, size, and orientation of piping and pipe components. Large bore piping includes that piping which is 2-1/2 inches and larger in diameter; small bore piping is that piping less than 2-1/2 inches in diameter. The installation work process and its attributes are the same for both large and small bore piping. The piping considered in this review includes all ASME code piping. ERC reported that all piping of large and small bore is installed by one contractor using the same installation procedure and specifications. The attributes corresponding to the installation of large and small bore piping appear to be accurate and complete.

(g) Pipe-Welds and Material. As with large and small bore pipe configuration, the welding of large and small bore pipe are considered as one grouping. Separate samples, however, will be utilized to address each. More than 66,000 welds are required to connect safety-related large and small bore piping. The work processes associated with welding of either large or small bore are pre-welding, welding, post-welding. As with the other categories within the mechanical discipline, the population description was reviewed and appeared complete. Welds addressed by this study include only field welds. All field welds were performed by Brown & Root.

The piping welding area was audited and verified for the following: (1) the basis for establishment of each population; (2) population boundaries; (3) population exclusions; (4) population list source and basis; (5) work process and basis; and (6) attributes associated with work process. The weld work processes and attributes appeared complete.

Based upon the fact that both large bore and small bore pipe welds were fabricated to the same procedure, ERC decided to lump the populations together. The staff reviewed the Large Bore Welding Materials (LBWM) and the Small Bore Welding Materials (SBWM) population basis, description memorandum, population description, populations item list and work process definition. ERC indicated that only one work process was chosen, Welding. The audit team expressed concern regarding the lumping of stainless steel welds with carbon steel welds. ERC pointed out that welder qualification is in compliance with Brown & Root Specification WES-031 which qualifies a welder to both carbon and stainless steel welding. The staff reviewed WES-031 and Brown & Root procedure CP-CPM-6.9D, "Welding and Related Processes", and found very few areas where the procedures or specifications differed with regard to stainless versus carbon steel welding.

The audit team also raised a concern about the two welding methods which were used for pipe welds; i.e., Gas Tungsten Arc Welding (GTAW) and Shielded Metal Arc Welding (SMAW). ERC will address this concern by ensuring that adequate samples of each weld method are selected for reinspection from the Pipe Weld and Material (PIWM) population. In reviewing the welding work process for the above concern, it was emphasized that large and small bore piping welds are covered by the same welding procedures and specifications. Based on this, ERC has revised the population to combine large and small bore piping. This revision of the PIWM pupulation will result in a more homogeneous approach to the PIWM reinspection.

(h) Piping System Bolted Joints. Two work processes comprise the piping system bolted joint category. They are installation preparation and final bolt fitup. There are 7000 bolted joints at the Comanche Peak Steam Electric Station. The work processes and their attributes appear to adequately represent the bolting of piping joints. The procedure which governs this is CP-CPM-6.9E, Revision E. A flow chart and population description had been prepared to provide the basis for the sampling of bolted joints.

The following ERC procedures were reviewed during the audit:

1. Work Process Definitions

2. Population Description

3. Population Items List

The NRC auditors raised the concern on torque being an attribute and not a work process. the concern was relative to equipment specifications requiring a specific torque value on certain types of flanges and the reinspection attribute not containing sufficient samples. In the discussion with ERC, it

was noted that there are approximately 7000 items in the piping system bolted joint population. Of the approximately 7000 items, 6700 are in line-piping connections which were installed in accordance with Brown & Root Procedure CP-CPM-6.9E. Section 3.12 of the Brown & Root procedure did not require a specific torque value to be used.

The governing requirement was that the joint "shall be tightened sufficiently to prevent leakage during pressure testing." Since ISAP VII.C is addressing accepted items, only reinspection per the original specification is required. The only flanges which may have required specific torque values would therefore be in the Mechanical Equipment Population. ERC has reviewed the MEIN population and has only found approximately six flanges which required specific values. Therefore, the issue raised during the audit is not an issue for the Piping System Bolted Joints population.

It was also noted that the Population Description and Population Item Lists will be revised to delete instrument flanges. These will now be included in the electrical area.

5. Civil/Structural Discipline

The civil/structural discipline is divided into 15 populations which are:

(a) Concrete Placement
(b) Structural Steel
(c) Liners
(d) Fuel Pool Liner
(e) Fill and Backfill Placement
(f) Grout-Cement
(g) Grout-Epoxy
(h) Large Bore Pipe Supports - Rigid
(i) Large Bore Pipe Supports - Non-rigid
(j) Small Bore Pipe Supports

(k) Large Bore Pipe Whip Restraints
(l) Instrument Pipe/Tube Supports
(m) Category 1 Conduit Supports
(n) HVAC Duct Supports
(o) Equipment Supports

Most of these areas were discussed with ERC personnel by the NRC staff and consultants participating in the audit. Some areas have been reviewed in depth while others have been treated in a cursory manner. Populations (k) and (l) have not been reviewed as of this time because they had recently been formulated and the work processes and work process attributes were still being developed.

(a) Concrete Placement

The concrete placement population is presently subdivided into three work processes, each work process having various numbers of attributes. Some of the attributes are to be reviewed by means of a field reinspection; others can only be reviewed by means of a document review; and some will be reviewed utilizing both field reinspection and documentation review. A few concerns evolved from this audit; however, the work processes and attributes covering reinspection of concrete placement do establish an appropriate level of homogeneity. The concerns were discussed with ERC and were left as open items. The following is a list of open items:

1. ERC is to consider establishing cadwelds as a work process rather than as an attribute. ERC is to review the cadweld inspection procedure and the concrete pour card sign-off requirements to determine whether cadwelds should be a separate work process.

2. ERC is to consider establishing Richmond Inserts as a separate attribute instead of including it with the embedment attribute.

3. ERC is to determine if the condition exists where embedded pipe sleeves are used to anchor the piping system. If this situation does exist, the embedded sleeves should be a separate attribute.

(b) Structural Steel

After performing this general overview of the structural steel reinspection activity, it is felt that the work processes and attributes identified generally will achieve acceptable homogeneity.

(c) Liners

The containment liner population includes horizontal, vertical, and penetration welds. The work processes were reviewed and ERC was informed that consideration should be given to including a plumbness requirement as a work process. Also, it was suggested that ERC consider revising the tolerance when a 6-inch template is substituted for a 10-inch template.

(d) Fuel Pool Liners

The first audit addressed only the formation of the populations. All welds covered by travelers will form this population.

(e) Fill and Backfill Placement

The initial audit addressed the population formation and the work processes within the population. Testing is a work process within this population and not within concrete. Consideration should be given to the need for consistency. If testing is retained as a work process, the population description should be modified to reflect this as a separate work process.

(f/g) Grout-Cement/Grout-Epoxy

These are new populations which have not yet been reviewed.

(h/i/j) Large Bore Pipe Supports - Rigid (LBSR)/Nonrigid (LBSN)/Small Bore Pipe Supports (SBPS)

All of the noted pipe support populations were addressed in the audit. These populations were formulated in order to assure a proper sampling of rigid and non-rigid pipe supports. This is important, since the majority of "standard catalog supports" are in the non-rigid category. The small bore sampling was not divided, because the number of non-rigid small bore supports is very small and also because the type of support is not readily obvious from the support number (as in the case for LB supports). The SBPS population was made up of four work processes: fabrication, installation, welding, and inspection. The ERC management seemed to be at variance with the staff as to whether inspection should be a work process or an attribute. The two LB populations did not show inspection as a work process. After much discussion, the individual in charge of the SBPS group indicated that rework to a support very often occurred during the inspection phase as a result of an UNSAT Inspection Report (IR). Since this work was performed under the umbrella of inspection in order to close out the IR, this was a separate work process. the individuals in charge of the LB group appeared hesitant to accept this but eventually they did. However, at the exist interview, ERC upper management indicated that they would like to investigate this area further. They indicated that if they made any changes, they would contact the staff (the staff agrees with inspection being a separate work process).

The staff reviewed the population items list, work process justification, and attribute description and basis. An auditable trail existed such that all work processes and accompanying attributes could be verified. The staff noted that under pipe supports welding two attributes were

were omitted (cleanliness and base metal defects). ERC pointed out that cleanliness was unattainable both from a reinspection standpoint (preweld-ing attribute), and from the point of view of document review (cleanliness was not a hold point on the Multiple Weld Data Card (MWDC)). ERC also said that they did not include base metal defects for supports as an attribute, since it was difficult to see defects through the paint. The staff pointed out that requirements for identifying base metal defects existing in ASME Subsection NR-4000 and Brown & Root Procedures QI-QAP-11.1-28. ERC stated that during the reinspection of the sample supports, base metal defects were looked for in each case and noted as an "out of scope" observation for inclusion in the normal deviation system. The staff would not accept this, and asekd ERC to reconsider this approach. After some discussion, ERC committed to put base metal defects into the attribute list and to treat all instances as part of the construction adequacy.

(k) Large Bore Pipe Whip Restraints.

An overview of the pipe whip restraint population was provided by ERC. This population consists of moment restraints, pipe whip restraints and restraint support structures listed in section 3.6 of FSAR. Due to the original construction, two populations may be established, one for the restraint and one for the support structure. Nine systems have postulated line breaks. Some restraints are listed by Gibbs & Hill and other restriants are listed by Site Damage Group. At this time ERC is still reviewing the work process and is establishing which groups were responsible for installation.

(l/m/n/o) Instrument Pipe/Tube Supports//Category/Conduit Supports//HVAC Duct Supports//Equipment Supports.

These populations were formed after the initial audit and have not yet been reviewed.

6. SELECTION OF RANDOM SAMPLES

The purpose of the self-initiated Construction Adequacy Program is to provide additional confidence about the adequacy of installed hardware. This program is concentrating on construction completed items, only. However, the results of the program will be applicable by inference to ongoing construction activities.

To accomplish this goal, the applicant (through its contractor, ERC) will employ a statistical approach to reinspection of selected systems and/or components from the disciplines and populations previously described.

The critical element in this statistical approach is the selection of random samples for reinspection from a reasonably homogeneous population. In general, ERC will select enough random samples to test each attribute under each work process a minimum of 60 times. In addition to the random sample, an engineered sample representing only safe shutdown systems and components will be developed. As with the random sample, the goal will be to test each attribute within the engineered sample a minimum of 60 times. Because of the random sampling, it is highly probable there will be an overlap between the engineered sample and the random sample for any population. It is anticipated that approximately 95-100 samples will be required to meet the goal of testing each attribute from both samples a minimum of 60 times.

In some instances, it may be impractical or undesirable to test each attribute under each work process a minimum of 60 times. In such cases, the attribute(s) will be identified and a rationale provided for why they will not be tested a minimum of 60 times.

Documentation covering the sampling process will be provided. This documentation will include details of how populations, work processes, and attributes are established, how random numbers are assigned to populations and random samples taken, how random samples are expanded when required, and

justification for the number of tests for each attribute. This documentation constitutes an auditable trail. The audit team has determined that this auditable trail is in place.

The purpose of these audits was to determine that ERC's methodology, when implemented, would result in a truly random approach to sampling. The audit team did not address the statistical aspects of the program. The adequacy of the sample size, criteria for sample expansion based on the number of unacceptable reinspections, and the ultimate numeric confidence level goal are the subject of a separate evaluation.

7. DOCUMENTATION

The staff's goal in conducting the audits discussed in this report was better comprehension of the overall Construction Adequacy Program. Emphasis was placed on overall program methodology, population definition, work process definition and population homogeneity, selection of attributes, and whether or not the entire process was adequately documented.

In general, the audits were confined to technical discussions and review of the following types of documentation when available:

1. Gibbs Specifications
2. Brown & Root Procedures
3. TUGCO Inspection Procedures
4. ERC Population Descriptions
5. ERC Population Item Lists
6. ERC Definition of Work Processes
7. "A Million Random Digits" by the Rand Corporation
8. Drawings and/or equipment items lists covering plant construction and developed by TUGCO, Gibbs & Hill, Brown & Root, or sub-contractors.
9. Applicable vendor instructions/drawings

The amount of available documentation varied among the various populations. However, accomplishing the overall goal was not contingent upon having the same level of documentation available for all populations. Sufficient information was available to support staff conclusions regarding program methodology and capability to audit program development and implementation.

At the time of these audits, the population documentation packages were in various stages of development. In some instances, Quality Instructions had been completed. These documents provide the basis for implementing the reinspection effort. When available, these instructions were looked at. However, none were reviewed in detail, no conclusions were drawn regarding them, and they did not influence staff conclusions with the possible exception of additional confidence regarding an auditable documentation trail. Detailed review of Quality Instructions and other program implementation related documentation will be reviewed during the implementation phase of this program.