# C A S E

(CITIZENS ASSN. FOR SOUND ENERGY)

1426 S. Polk
Dallas, Texas 75224

214/946-9446




August 14, 1985

FEDERAL EXPRESS

Administrative Judge Peter B. Bloch
U. S. Nuclear Regulatory Commission
4350 East/West Highway, 4th Floor
Bethesda, Maryland 20814

Dr. Kenneth A. McCollom
c/o Neal McCollom
4851 Winesanker Way
Fort Worth, Texas 76133

Dr. Walter H. Jordan
881 W. Outer Drive
Oak Ridge, Tennessee 37830

Dear Administrative Judges:

Subject: In the Matter of
Texas Utilities Electric Company et al.
Application for an Operating License for
Comanche Peak Steam Electric Station,
Units 1 and 2
Docket Nos. 50-445 and 50-446

CASE's First Critique of Applicants'
Comanche Peak Response Team (CPRT) Plan

We are attaching CASE's First Critique of Applicants' Comanche Peak Response Team (CPRT) Plan, which we have also sent to Mr. Vincent Noonan, NRC Director, Comanche Peak Project, by Federal Express today.

As discussed in our Critique, we want to make it very clear that CASE's presentation of these specific criticisms of the CPRT Plan should not be construed as changing CASE's basic position: that Comanche Peak is unlicensable in its present condition, and that, at a minimum, a 100% reinspection is needed of both design and construction (in that order). (See additional discussion on pages 1 and 2 of the Critique, and CASE's earlier pleadings, especially CASE's 7/29/85 Initial Response to Applicants' 6/28/85 Current Management Views and Management Plan for Resolution of All Issues, especially pages 13 through 15 and 19 through 22.)

CASE is attempting to elucidate some of the numerous and severe shortcomings of the proposed Plan, even though our first Critique was necessarily very rushed and allowed only a partial assessment at this time, and though we were working under the handicaps of the lack of specificity in the Plan and the lack of necessary documents. Even under such restrictions, however, it is obvious that there are major and very fundamental flaws in the Plan which will doom it to failure and end up proving nothing.

In addition, CASE does not consider the Applicants' CPRT Plan to be adequate -- or to have the capability at this point in time of becoming adequate (due to the basic and fundamental failure early on, by both Applicants and the NRC Staff, to assure that it would be an independent protocol-controlled effort from its inception) -- to offer assurance that Comanche Peak has been designed and constructed such that the public health and safety will not be jeopardized.

Further, it is CASE's belief (as discussed in detail in the attached Critique) that what Applicants are proposing is in many instances in clear violation of the industry codes and standards to which they are committed, as well as NRC regulations.

We are not addressing design or issue-specific action plans at this time (see pages 2 and 3 for a discussion of what is included).

There are many other specific criticisms contained in the attached Critique. In addition to our criticisms, we are also making some specific recommendations (see pages 24 through 36 of the Critique, "Summary and Recommendations").

We must point out that, despite the Licensing Board's assurances that CASE would not be harmed by awaiting responses to discovery requests, in the real world our due process rights have already been severely damaged by Applicants' latest legal strategies. (This will be discussed in more detail in later pleadings.)

CASE asks that the Board consider our Critique in its deliberations and consideration of Applicants' CASE Management Plan and the CPRT Plan. Also, we will be filing additional specific critiques in the future.

Respectfully submitted,

Juanita Ellis

(Mrs.) Juanita Ellis
President

cc: Service List

Administrative Judge Herbert Grossman

CASE's First Critique of Applicants' Comanche Peak Response Team (CPRT) Plan

This is the first of what is anticipated to be a series of answers to the CPRT Plan. It should not be construed to constitute CASE's complete answer to the CPRT Plan. Further, we want to make clear at the very outset that CASE's presentation of these specific criticisms of the CPRT Plan should not be construed as changing CASE's basic position that Comanche Peak is unlicensable in its present condition, and that, at a minimum, a 100% reinspection is needed of both design and construction (in that order). We also want to emphasize that CASE does not accept Applicants' assessment of the current state of the record in the operating license proceedings, their claims of mootness, their identification of open issues, their approach, or their timetable. In particular, CASE does not accept Applicants' attempts to belittle or downgrade issues identified in the operating license hearings or, as in the case of the Walsh/Doyle allegations, to ignore them entirely.

The following is CASE's first substantive critique of the reinspection plan which Applicants currently allege is appropriate for Comanche Peak. CASE does not agree with Applicants' allegation. However, we are going to attempt to elucidate the shortcomings of the proposed Plan, as well as to suggest minimum requirements. CASE is attempting to do this even though we realize that the CPRT Plan lacks necessary specificity, that key information is still missing from the Plan, that this will be an iterative CPRT Plan, and that therefore supplemental critiques will be necessary (either should additional input from CASE be desired by the NRC Staff or should this Plan

ultimately be unjustly accepted by the Atomic Safety & Licensing Board).

We are not addressing design or issue-specific action plans at this time. We are addressing only the Exploratory Evaluations portion of the Plan. Additional specific critiques will be forthcoming in the future.

CPRT SAMPLING (see: CPRT Plan, Appendix D, CPRT Sampling Approach, Applications, and Guidelines; Transcripts of June 13 and 14, 1985 Applicants/NRC Staff meeting; and Applicants' 8/1/85 letter to NRC Staff, re: Visual Inspection of Painted Non-Pressure Boundary Welds):

CASE is of the opinion that the CPRT sampling approach is inadequate. The approach assumes that exploratory evaluations with no further data can reliably provide enough information to decide whether or not that portion of the plant being explored is safe. And the CPRT Plan further states that, in general, a 95/5 criterion will be used to determine sample size. Even criteria which is this sloppy will not be applied for the design process, however. It is simply stated "[design] discrepancies can be detected with a small sample because of their generic nature" (CPRT Plan, Appendix D, page 2 of 11, first full paragraph).

In addition, what Applicants are proposing to do in the CPRT program is to address only those TRT issues remaining after the initial safety-significant screening process by the TRT in their SSER's (wherein many allegations, although substantiated, were considered not to be safety-significant by the TRT) -- which SSER's have not yet been admitted into evidence in the licensing proceedings. Applicants then propose to employ a further screening process (into deviation, deficiency, or safety-related) of

their own -- a process which has not only not yet been admitted into evidence in the licensing proceedings, but also has not yet even been fully investigated by CASE through discovery. This proposed process ignores the best evidence rule, wherein first-hand information is relied upon. The Applicants are going to rely on processes that have been screened by a number of other people, rather than relying solely upon the original source.

## I. Exploratory Evaluations

CASE will first address exploratory evaluations and the following issues will be independently addressed:

A. The appropriateness of categories;

B. The appropriateness of discrepancy detection levels;

C. The appropriateness of confidence levels;

D. Reliability (confidence level) of inspection personnel;

E. Reliability (confidence level) of inspection process;

F. Reliability (confidence level) of inspection attributes; and

G. Overall confidence level and sample size.

In order to address these, we will use welding as one specific example (of numerous possible examples) to demonstrate our generic points, which should then be applied in an appropriate manner to each specific and generic problem area identified by the CPRT (as well as to those which have not been identified).

A. The appropriateness of categories

The CPRT Plan describes at least six different categories in which to place problems: discrepancy, deviation, deficiency, safety-significant, programmatic deviation, programmatic deficiency. The least severe problem exists with the discrepancy, which is described to be an error which could potentially have an adverse impact. Evidently the most severe problem would be a programmatic deficiency, which is described to be a safety-significant adverse programmatic trend. These categories should be contrasted with the following categories which have been established for welding inspection by the American Welding Society (AWS). It should be noted that Applicants are committed to AWS D1.1-75 for welding on other than ASME pipe supports. The 1984 AWS Welding Handbook lists:

1. discontinuity;
2. flaw; and
3. defect.

-- from 1984 Welding Handbook, Seventh Edition, Volume 5, Engineering, Costs, Quality, and Safety, page 321, NONDESTRUCTIVE TESTING, DEFINITIONS AND GENERAL DESCRIPTION

The discontinuity is simply something that is not planned and is not necessarily a defect.

A flaw is the next most serious problem and contains a connotation of undesirability, although it is not necessarily a defect.

A defect is a problem which is unable to meet specifications or acceptance standards.

Note that there is nothing in the CPRT categorizations similar to the discontinuity category from the AWS Handbook. This means that the screening process proposed by the Applicants will lose permanently those things which do not correspond to the planned procedures but have not been deemed to be a deficiency (CPRT definition).

By excluding this information, the Applicants and all reviewers of their CPRT Plan will lose much significant information as to the conduct of the QA/QC program at Comanche Peak. This information would be required in its entirety for any scientifically based conclusion to be drawn as to the adequacy of the Applicants' in-place QA/QC program during the design and construction phases.

B. The appropriateness of discrepancy detection levels

The CPRT states that they will generally apply a criteria which permits detection of discrepancies with as low as a 5% occurrence. CASE is of the opinion that the appropriateness of this number (5%) should be dependent upon the specific class of hardware or activity under consideration. For example, is a 5% occurrence of discrepancies of the welds in the primary coolant system an appropriate detection level? CASE is of the opinion that this is obviously not the case, and feels sure that the NRC Staff, the Applicants and the Board would agree. Justification for anything other than a 0% occurrence on Class 1 work is considered to be mandatory by CASE. For either or both Class 2 and Class 3 work, whatever detection level is finally specifically proposed by the Applicants must be justified in CASE's opinion.

Furthermore, the Applicants state that they intend this detection level to apply to discrepancies, which is to be contrasted to the category proposed by CASE corresponding to discontinuities. The proposed action by the Applicants would detect only something which is potentially adverse to safety -- not something which is contrary to standards and/or procedures. Once again, the proposed sample size would depend upon only problems considered to be potentially safety-related, which would mean that much QA/QC data would be lost permanently. The sample size chosen by Applicants' criteria would be inappropriate for investigating the adequacy of the QA/QC program.

C. The appropriateness of confidence levels

The suggested confidence level by the Applicants is 95%. CASE can find no justification attempted by Applicants to support this number. CASE questions the appropriateness of a 95% confidence level for welds in the primary coolant system, for example. CASE believes that the Applicants should be required to provide complete numerical analyses of their proposals, along with anything else which might justify their suggested confidence level. In the interim, CASE would reject any of their suggestions in this regard, and would urge that the NRC Staff do likewise.

D. Reliability (confidence level) of inspection personnel

In order to attain the proposed confidence level, whatever is decided is appropriate, it is necessary to take into consideration that inspection personnel are human beings, who are not 100% reliable. A careful choice of personnel is imperative, but still will not guarantee 100% reliability. The Applicants should be required to include this consideration in their numerical analysis, with justification for whatever confidence level they claim is appropriate for their inspection personnel.

CASE believes that it is well documented that substantially less than perfect execution was in fact achieved during the original inspection. For example, from SSER #11 (page P-31):

> ". . . QC inspectors in many instances failed to follow design documents and the quality procedures for inspection. . . In conclusion, the QA/QC Group [of the TRT] considers the site QC inspection program to be less than fully effective in monitoring, detecting, and reporting deficiencies that have or could have a significant safety impact on the plant."
>
> -- from NUREG-0797, Supplement No. 11, Safety Evaluation Report related to the operation of Comanche Peak Steam Electric Station, Units 1 and 2, May 1985

Further, there is every reason to believe that the reinspection will yield even lower confidence levels, even with perfect execution by the CPRT. CASE contends that this factor must be accounted for in determining the proper sample size. It is obvious that the required sample size will necessarily have to be increased from that stated by the Applicants.

E. Reliability (confidence level) of inspection process

The Applicants state that they plan to rely upon visual inspection only as versus the use of liquid penetrant, magnetic particles, radiography, destructive testing, etc. The original inspection plan of the Applicants also relied exclusively (in most cases) on visual examination. However, this was a compromise in that they used an inspection process which was more economical than the most preferred methods. For example, welds were not X-rayed or tested to destruction. Even if a large sampling approach had been adopted and welds tested to destruction, this testing process would not have yielded a 100% confidence level. Obviously, the welds which would eventually be used could not be tested to destruction, and there would still be some question (however small) of their integrity. Similarly, radiography will not provide a 100% confidence level either.

It is therefore obvious that the original visual inspection yielded a less than 100% confidence level. There is no documentation establishing the precise confidence level which was expected to be achieved (assuming total perfection in the inspection process). There is no assurance that a 95% confidence level could have been achieved, even with perfect execution by all participants, during the original inspection.

F. Reliability (confidence level) of inspection attributes

The proposed reinspection program relies upon a depleted list of attributes to provide all information necessary to make a safety decision.

The CPRT Plan fails to list the recommended attributes to be relied upon. CASE did obtain, however, a copy of the August 1, 1985, letter from Applicants' W. G. Counsil, to NRC Staff's Vincent Noonan, under subject of "Visual Inspection of Painted Non-Pressure Boundary Welds."

This letter lists those weld attributes which are considered critical for weld strength as:

undercut
lack of fusion (usually associated with overlaps)
cracks
weld length and size
existence
location

It contains an additional list of the remaining inspection attributes, as:

craters
arc strikes
porosity
weld profile
slag
spatter

Evidently these remaining attributes are not considered by Applicants to be critical for weld strength, by implication. This list should be contrasted to the lists supplied by AWS /1/ and/or Applicants' own Inspection Report (IR) Form.

---

/1/ See, for example, the following: AWS D1.1-75, 8.15 Quality of Welds, 8.15.1 Visual Inspection; 1984 AWS Welding Handbook, Seventh Edition, Volume 5, Engineering, Costs, Quality, and Safety, pages 302, Significance to Weld Integrity, Surface Irregularities, and pages 321 through 326, Definitions and General Description, Visual Inspection, Nondestructive Testing Methods, During Welding, and After Welding.

In addition to those attributes listed in Applicants' 8/1/85 letter, the following attributes are listed as appropriate inspection criteria (all of which are omitted from consideration by the Applicants):

incomplete penetration
corrosion
fit-up defects
wall thickness
dimensional evaluation
lack of bond
material as per drawing
welding as per symbol on drawing
weld cleanliness
compliance with bill of materials
support level and plumb
support drawing number and revision number
CMC, including revision numbers
welder symbol
heat number
WFML (Weld Filler Material Log) number
Weld Procedure Specification (WPS)
torque previously verified?
related NCR number
IR closed

The Counsil memorandum appears to CASE to be a precursor of the Applicants' logic to be expected hereafter. Those attributes considered by Applicants to be the "remaining inspection attributes" represent half of the attributes listed and appear to be a prejudgement that these problems will fall into some minor category. No adequate justification is supplied for this prejudgement.

Further, the Applicants contend that all of these attributes, with the exception of cracks, are detectable and measurable whether paint is present or not. Then they define away cracking problems by saying that the TRT has reported no evidence of cracking, without taking into consideration that the

TRT was itself in most instances looking at paint (painted welds). They reference several separate reviews which fail to document evidence of weld cracking without stating what reports they are referring to and what the condition of the weld was at the time it was being viewed (painted or not). Furthermore, they say that from a metallurgical standpoint, there is no reason to suspect weld cracking problems -- CASE is certain that from a metallurgical standpoint there is no reason to suspect any problem. Obviously, when one designs something, one expects it to work.

By this obtuse reasoning, Applicants are evidently planning to ignore cracking as a potential problem at Comanche Peak. This action is being proposed even though AWS (page 302) states:

> "Cracking . . . constitutes the weld discontinuity considered most detrimental to performance. A crack . . . acts as a stress concentrator. The stress concentration effect . . . is greater than that of other discontinuities. Therefore, cracks are not normally permitted, regardless of size. . ."

Also, the ASME Code states (ASME Code of Record, 1974 with Winter Addenda, Section III, Division 1, Subsection NF):

> "NF-5200 REQUIRED EXAMINATION OF WELDS
> "NF-5210 EXAMINATION OF CLASS 1 SUPPORT WELDS
> "NF-5212 Class 1 Linear Type Support Welds
> "(a) All [listed welds] . . . shall be radiographed . . . [or] ultrasonic examination shall be performed . . . In addition . . . shall be examined by either the magnetic particle or liquid penetrant method.
> "(b) When the requirements of (a) can not be met . . . shall be examined by either the magnetic particle or liquid penetrant method.
> "(c) All other welds shall be visually examined to the acceptance standards specified in NF-5360.
>
> "NF-5220 EXAMINATION OF CLASS 2 AND CLASS MC SUPPORT WELDS
> "NF-5222 Class 2 and Class MC Linear Type Support Welds
> "All welds of linear type supports shall be visually examined to the acceptance standards of NF-5360."

"NF-5230 EXAMINATION OF CLASS 3 SUPPORT WELDS
"NF-5232 Class 3 Linear Type Support Welds
"All linear type support welds shall be visually examined to the acceptance standards of NF-5360."

"NF-5360 ACCEPTANCE STANDARDS FOR VISUAL EXAMINATION OF WELDS
"(b) Unless otherwise specified in this Subsection, cracks or other linear indications are unacceptable."

And from AWS D1.1-75, page 92, 8.15 Quality of Welds:

"8.15.1 Visual Inspection. All welds shall be visually inspected. A weld shall be acceptable by visual inspection if it shows that:
"8.15.1.1 The weld has no cracks. . . "

Also from AWS (page 326), one can conclude that cracking can take place such that it would not be observable by visual examination alone (with or without paint):

"The most critical part of any weld is the root pass because many weld discontinuities are associated with the root area. Competant visual inspection of the root pass will help to avoid discontinuities in the completed weld. . . The root opening should be monitored as welding of the root pass progresses. Special emphasis should be placed on the adequacy of tack welds, clamps, or braces designed to maintain the specified root opening to assure proper joint penetration and alignment. . . Inspection of successive layers of weld metal usually concentrates on bead shape and interpass cleaning. . . Each layer of the production weld may be compared with the corresponding layer of the workmanship standard. . . When preheat and interpass temperatures are specified, they should be monitored at the proper times with a suitable temperature measuring device (e.g., crayons or pyrometer). The amount of heat input and also the sequence and placement of each weld pass may be specified to maintain mechanical properties or limit distortion, or both.

"To ensure the quality. . . each weld layer should be visually checked by the welder for surface irregulatiries and adequate interpass cleaning to avoid slag inclusions or porosity."

In addition, Table 9.1 (page 322) lists "Nondestructive testing methods, Visual" as applying to welds which have discontinuities on the

surface, and the "Limitations" of the visual testing method are that it is "Limited to external or surface conditions only" and "Limited to the visual acuity of the observer/inspector."

Further, the NRC Staff's own expert witness, William J. Collins (Senior Metallurgical Engineering, NRC Engineering Communications Branch, a Division of the Engineering Preparedness and Engineering Response) testified in the operating license hearings that "You only see the indication of the surface conditions" with visual inspection (Tr. 12159/5-8).

This recommendation by Applicants to ignore cracking as a potential problem at Comanche Peak is very disappointing and very serious in light of the documented judgement that cracking is the most serious discontinuity that could be encountered.

But the Applicants do not limit their obtuse reasoning to cracking only. In Applicants' 8/1/85 letter to the NRC Staff, they state that undercut is actually emphasized by the existence of paint and that regardless, both undercuts and overlap are only significant where fatigue loading is a factor. Then they state (without offering any justification) that fatigue loading is not a factor for these welds.

That seems to take care of undercut, lack of fusion, and cracks (at least according to Applicants' letter), and one can easily determine whether or not a weld exists, which takes care of the existence attribute. This leaves only weld length and size, and location, as attributes which would contribute to an evaluation of weld strength. Since one would not locate a

weld in the middle of a pipe, location is a vague attribute, leaving only weld length and size as weld attributes which Applicants consider critical for weld strength.

Then, unbelievably, the Applicants state that the welding history at Comanche Peak allows them to conclude that only one inspection attribute has presented deficiencies -- weld undersize. Is one to conclude that the Applicants intend to send out well-trained people to check weld undersize to justify Applicants' receiving a welding passing grade?

Another consideration has come to CASE's attention. Please note that ASME Code states:

> "Direct visual examination may usually be made when access is sufficient to place the eye within 24 in. of the surface to be examined and at an angle not less than 30 deg. to the surface to be examined. . . The specific part, component, vessel, or section thereof, under immediate examination, shall be illuminated . . . to attain a minimum of 15 fc for general examination and a minimum of 50 fc for the detection or study of small anomalies. Visual examination personnel shall have an annual visual examination to assure nature or corrected near distance acuity such that they are capable of reading standard J-1 letters on standard Jaeger test type charts for near vision or equivalent methods."
>
> -- from the American Society of Mechanical Engineers (ASME) Code (Section V, Nondestructive Examination, 1983 Edition, July 1, 1983, page 84, "Direct Visual Examination")

CASE recognizes that the current QA/QC team has not addressed this matter of visual acuity. However, the Applicants' previous QA/QC program has, with the resulting procedural requirements for their inspectors, as discussed by the NRC Technical Review Team (TRT) in SSER 9 (page M-98):

> "The TRT reviewed the governing procedures and specifically examined QI-QP-11.4-1, Revision 20, March 5, 1984, which is currently in effect. Paragraph 3.0 of that instruction states: 'Visual inspection of

surfaces as addressed by this instruction shall be made at approximately an arms length from the surface being inspected. The area of inspection shall be adequately lighted during the inspection activity. Adequate lighting is defined as the minimum light produced by a two (2) D-cell battery flashlight. Flashlight shall be held perpendicular to the surface during visual inspection.' The TRT considers the language of this paragraph to be vague, technically inapproproate, and contrary to recognized standard practice for performing visual inspections of coatings."

-- from NUREG-0797, Supplement No. 9, March 1985, Safety Evaluation Report related to the operation of Comanche Peak Steam Electric Station, Units 1 and 2, page M-98, top paragraph

It is obvious that any organization capable of developing a procedure so patently inadequate and deliberately designed to hamper good QC inspection cannot be relied upon to develop the criteria and procedures to be utilized in the upcoming reinspection effort.

The TRT should be aware that there are significant problems (in CASE's opinion) with the Applicants' evaluation of those weld attributes which they themselves consider critical for weld strength, whether paint is a factor or not. The easy manner in which Applicants dismiss these attributes is very disturbing. And when one realizes that these are the only ones that count (as stated by the Applicants), and that this represents the first specific work product (of which CASE is aware) of the brand spanking new management at Comanche Peak, the expected final report will represent very little, if any, change from the quality of the reports already submitted by the Applicants /2/. The conclusion is foregone. The work is futile, for it will prove nothing.

---

/2/ Furthermore, almost all of the members of the CPRT are, in fact, anticipated transients in that they plan to move on immediately after they finish the necessary paperwork to obtain an operating license for Comanche Peak.

The situation does not improve when one considers what the Applicants describe as "the remaining inspection attributes." Because of the manner in which they are described, CASE assumes (we think with good reason) that in the final Applicants' report, these will end up being very insignificant attributes.

Many of the listed attributes should have been totally cleaned up according to the procedures in the original QA/QC plan making them no longer observable. Because of this, CASE wishes to emphasize that the attributes, if found to be still present during the reinspection, represent serious shortcomings -- more serious than described in the codes and standards. Yet the Applicants appear to downgrade these attributes when considered with respect to the codes and standards. For example, John Hansel, the CPRT review team leader for the QA/QC area, stated during the 6/13/85 NRC Staff/Applicants meeting, in response to a question from NRC Region IV Administrator Robert Martin:

> "MR. MARTIN: Those attributes which are safety significant attributes, is it possible or likely that they will be inspected against more specific criteria than were contained in the codes or standards that were applicable at the time of the original inspection?
>
> "MR. HANSEL: No, I would anticipate them to be equal to or less than."

However, when one investigates the codes and standards, one encounters a far different perception. For example, from AWS (page 302):

> "Spatter . . . is quite likely indicative of improper welding technique and of the likelihood of other associated faults."

. . . and from page 28 of AWS D1.1-75:

"3.10 Cleaning and Protective Coatings
"3.10.1 ". . . The surfaces to be painted shall be cleaned of spatter . . . "

With respect to arc strikes (AWS Welding Handbook, Seventh Edition, Volume 5, Engineering, Costs, Quality, and Safety, page 302, Weld Quality, Surface Irregularities):

"Arc strikes . . . can initiate failure in bending or cyclic loading. They can create a hard and brittle condition in alloy steels, and are inadvisable even on mild steel when . . . normal fatigue stresses may be encountered."

Regarding slag, from AWS D1.1-75 (page 28):

"3.10 Cleaning and Protective Coatings
"3.10.1 Slag shall be cleaned from all welds."

From Welding Handbook, Seventh Edition, Volume 5, page 326, INSPECTION, During Welding:

"To ensure the quality of the weld as work progresses, each weld layer should be visually checked by the welder for surface irregularities and adequate interpass cleaning to avoid slag inclusions or porosity."

Although CASE realizes that the Applicants may not be recommending that all welds be inspected through paint, the very idea of conducting an investigation of porosity and craters with paint present stretches the imagination. The Applicants contend that the primer and epoxy topcoat average approximately 10 mils. How Applicants determined that the paint was no thicker than 10 mils or whatever in the presence of craters is unknown and illogical. One would normally expect paint to build up in areas of discontinuities such as this. Matters other than thickness are also important.

For example, if there is a lack of adhesion, visual inspection may not detect even gross discontinuities. This is precisely the situation at Comanche Peak, as demonstrated by the following from SSER No. 9:

> ". . . reasonably accurate estimates of the adhesion test failure rate and the corresponding failed areas can be made for the coatings on the Containment Building liner and concrete surfaces. . . The TRT's corrected data failure rate is approximately 19 percent, in contrast to TUEC's uncorrected data failure rate of less than 1 percent. A 19-percent miscellaneous steel failure rate corresponds to a failed coating area of 34,200 square feet. . . this figure, in addition to the failed areas of the Containment Building liner and the concrete, gives a total of approximately 57,500 square feet of coatings which failed adhesion tests. . . "
>
> -- from NUREG-0797, Supplement No. 9, Safety Evaluation Report related to the operation of Comanche Peak Steam Electric Station, Units 1 and 2, March 1985, page M-44

In addition, the uniformity of the paint cannot be counted on due to the following factors. From SSER No. 11:

> "The TRT also found that many craftsmen that transferred into QC inspection had no prior background or experience in inspection. This was especially true in the coatings area when painters were made 'instant' QC paint inspectors."
>
> -- from NUREG-0797, Supplement No. 11, Safety Evaluation Report related to the operation of Comanche Peak Steam Electric Station, Units 1 and 2, May 1985, page P-29

We understand that the NRC's own Technical Review Team (TRT) has had problems inspecting through paint. From SSER #10:

> "During a walkdown inspection with the TRT on January 10, 1985, the alleger identified a pipe support as the support mentioned in his allegation. . . Visual inspections by the TRT of piping adjacent to the support to examine the repair to the gouge were unsuccessful because the pipe was painted."
>
> -- from NUREG-0797, Supplement No. 10, Safety Evaluation Report related to the operation of Comanche Peak Steam Electric Station, Units 1 and 2, April 1985, page N-91, third paragraph

When these factors are considered, an adequate and accurate inspection through paint would be next to impossible.

It is CASE's understanding that one of the primary objectives for applying coatings is to preclude the accumulation of radioactive material. Paint changes the porosity of the material to which it is applied, and this change in porosity is considered to be a desirable characteristic. To suggest that the porosity can be inspected through paint is contradictory to the primary objective of applying coating. An additional objective for applying protective coatings is to create a smooth surface which will prevent the accumulation of radioactive water. To achieve this, permanent change in the visual characteristics of many of the attributes listed will take place in addition to changes in porosity.

Furthermore, as stated in the AWS Welding Handbook, Seventh Edition, Volume 5, Inspection, page 326, After Welding:

> "For accurate detection of such discontinuities [cracks, undercut, overlap, exposed porosity and slag inclusions, unacceptable weld profile, roughness of the weld faces], the weld surface should be thoroughly cleaned of oxide and slag."

This precludes the idea of looking through paint. In fact, the codes require that inspection take place prior to the application of paint. From AWS D1.1-75, page 42:

> "**3.11.2 Cleaning of Completed Welds.** . . . Welded joints shall not be painted until after the work has been completed and accepted."

Industry codes and standards appear to suggest that relying upon any subset of attributes is inadequate and that the cumulative results of

investigations of all attributes is much more significant than the sum of its parts. This is an aspect which Applicants are apparently totally ignoring (as has been their pattern in the past regarding cumulative effects concerning pipe supports).

From AWS:

"Visual examination, as indicated above, is invaluable as an inspection method; however, some caution must be used in drawing conclusions. For example, good surface appearance is often regarded as indicative of careful workmanship and high weld quality. However, surface appearance alone does not prove careful workmanship and is not a reliable indication of subsurface condition. Thus, judgment of weld quality must be based on evidence that is in addition to that afforded by surface indications. Such additional evidence is afforded by observations that have been made prior to and during welding. For instance, if the inspector knows that the plate was free of laminations, that the edge preparation was correct, that root opening was as specified, that the root pass was sound, and that the qualified welding procedure was followed carefully, he may be reasonably safe in judging the completed weld on the basis of visual examination."

-- from the AWS Welding Handbook, Seventh Edition, Volume 2, Welding Processes -- Arc and Gas Welding and Cutting, Brazing, and Soldering, page 121, Welding Inspection, Summary

And from the AISC Code:

"A. Workmanship
". . . the acceptability of the welded product is often dependent on the interrelations and variations of the individual elements of workmanship.

"AISC Recommendation:

"Significant consideration must be given to each major element essential to achieving sound welds. Such elements as joint preparation, fit-up, cleaning, preheat, techniques, processes, and procedures are each important when considered singly, and more important when considered collectively, since variations from good practice in any one element multiplied by variations in other areas

often progressively narrow the probability for acceptable welds. These elements are adequately described in AWS D1.1."

-- from the November 1, 1978, American Institute of Steel Construction (AISC) Specification for the Design, Fabrication and Erection of Structural Steel for Buildings, page 28, Chapter 4, Welding, II. PRODUCTION OPERATIONS

CASE is not aware of any plan by Applicants to consider cumulative effects. To do so would require accumulation of associated data into retrievable cumulative form. No evidence of this capability has been presented by the Applicants. In addition, the mathematics associated with determining sample size relies on singular attributes. The mathematics employed are in general applied to large volume production lines (for example, a production line where a uniform product hopefully is being produced). A nuclear power plant is not a production line. Comanche Peak, in particular, does not exibit the characteristics of a uniform product. This entire approach needs to be revisited and revamped.

## G. Overall confidence level and sample size

The Applicants are suggesting that they choose a "representative" system affecting the complete plant, but this too is in effect a request for a sampling process. This sampling process is in addition to the sampling process suggested for exploratory evaluations, and (as CASE has pointed out) does not take into consideration the uncertainties introduced by the use of imperfect people, a less than a 100% reliable test (e.g., destructive test and/or radiography), and the use of a depleted list of attributes. This double sampling process changes the mathematics involved in determining the

required sample size -- even in the event that the other listed considerations were properly factored in. When determining proper sample size, the Applicants do not take into consideration the fact that the exploratory inspection is, in fact, a second inspection.

The Applicants choose not to inspect the primary coolant loop. The Applicants state that their "self-initiated" inspection system was chosen to obtain a representation of all distinctly different types of processes. However, the primary coolant loop is the most safety-significant system and it is CASE's opinion that it is imperative that any reinspection program make sure that the most safety-significant systems are reinspected first. CASE recognizes that some obstacles to effective testing are uniquely present on the most safety-significant systems (e.g., insulation around piping on some vital safety lines); however, this is no excuse for ignoring these systems -- whatever the underlying reason (economics, time, effort, etc.).

As noted throughout this document, during the first inspection it was a requirement that most of the attributes referenced be cleaned up and therefore they would not now be inspectable. Yet, the cumulative effect of seemingly non-safety discontinuities can have safety significance, again as previously indicated. But these seemingly non-safety discontinuities cannot now be visually inspected -- yet they remain potentially very significant.

In addition to the inability to inspect discontinuities, the Applicants do not plan to establish the condition of other very significant circumstances. For example, AWS states:

> "The welder is usually directly responsible for these discontinuities [badly-shaped, irregular surface ripples,excessive spatter, craters, protrusions (an overfilled crater), arc strikes] as a result of

incorrect welding technique or improper machine settings. Sound welds finished in a poor manner should not be accepted, even though the joint is adequate for the intended service. The ability and integrity of the welder must be questioned."

-- from the AWS Welding Handbook, Seventh Edition, Volume 5, Engineering, Costs, Quality, and Safety, page 302, Surface Irregularities

". . . Some of the aspects of fabrication that can be checked [during welding] include the following:

"(1) Treatment of tack welds
"(2) Quality of the root pass and the succeeding weld layers
"(3) Proper preheat and interpass temperatures
"(4) Sequence of weld passes
"(5) Interpass cleaning
"(6) Root preparation prior to welding a second side
"(7) Conformance with the applicable procedure

". . . When preheat and interpass temperatures are specified, they should be monitored at the proper times with a suitable temperature measuring device . . ." (emphasis added)

-- from Id, page 326, INSPECTION, During Welding

The Applicants' proposed program cannot recapture any of this information, yet this information is critical in determining whether or not a proper weld has been made.

In addition, the different individuals involved (the welders, QC inspectors, etc.) make critical contributions to the success of the welding operation, and it is imperative for them to be well-qualified. NRC Staff expert witness Mr. Collins testified that it is not the tests or procedures that determine weld quality, but rather the quality of the welder (Tr. 12186/8-11). And, regarding inspectors, from ASME ARTICLE NF-5000 EXAMINATION, NF-5520 PERSONNEL QUALIFICATION, NF-5521 Qualification Procedure:

"(a) Personnel performing nondestructive examination under this Section shall be qualified in accordance with SNT-TC-1A, Supplements and Appendices as applicable for the technique and methods used. For nondestructive examination methods not covered by SNT-TC-1A documents, personnel shall be qualified by the Manufacturer or Installer to comparable levels of competency by subjection to comparable examinations on the particular method involved. The practical portion of the qualification shall be performed using the Manufacturer's or Installer's procedure or part representative of the Manufacturer's products. . .

"/1/ SNT-TC-1A and Supplements is a Recommended Practice for Nondestructive Testing Personnel Qualification and Certification published by the American Society for Nondestructive Testing, 914 Chicago Avenue, Evanston, Illinois 60202."

Again, this information is not going to be retrieved.

The safe operation of the plant during critical periods may well depend upon retrievability of appropriate documents -- documents which reflect the true as-built condition. This information is not being retrieved either.

## Summary and Recommendations

In addition to the other concerns discussed herein, CASE is very concerned about the commitment of the present CPRT because of statements such as the following quote from its QA/QC leader, Mr. Hansel:

". . . I was provided through the [Applicants'] attorneys a summary of the harassment and intimidation information. And I have researched myself that list to satisfy myself that each of those items were in fact covered in one of our current issues specific plans. So that's a pretty good summary. I feel that that area has been covered."

-- from Transcript of 6/13/85 NRC Staff/Applicants Meeting, Afternoon Session, Tr. 161, lines 11-17

Even though CASE has not as yet gone through the calculations to prove that the database formed as a result of the proposed reinspections will not provide enough information to substantiate whether or not the plant is safe, CASE maintains that this is indeed the situation. The proper inclusion of a depleted attribute list, the effect of imperfect people, the effect of using visual inspections, the effect of sampling a sample, and incorporation of cumulative effects will all reduce the confidence level for a particular sample size. CASE feels certain that the results will require that the sample size be quite large, most probably 100%, to provide anything close to a 95% confidence level. And no justification for using just a 95% confidence level has been submitted to date (to CASE's knowledge).

It should be remembered that CASE is at a severe disadvantage at this time in attempting to evaluate and respond to Applicants' CPRT Plan. Not only is the Plan itself extremely vague and lacking essential specificity, but CASE is being excluded from what are obviously very important and relevant meetings between Applicants and the NRC Staff. In addition, CASE has not been supplied with necessary documents which are needed to thoroughly evaluate and respond to the CPRT Plan. We call attention specifically to the 8/1/85 previously-mentioned letter from Applicants' W. G. Counsil to NRC Staff's Vincent S. Noonan (re: Visual Inspection of Painted Non-Pressure Boundary Welds), which states (third page):

> "A detailed study supporting our decision [to visually reinspect non-pressure boundary welds through paint] was given to members of Region IV staff on July 2, 1985, following a detailed briefing of the rationale behind the decision."

It is unknown whether or not there have been other similar secret closed-door meetings /3/.

CASE objects most stringently to these unadvertised, closed-door sessions between Applicants and NRC Staff during which relevant and material information was discussed, and relevant and material documents were distributed -- information and documents which are applicable not only to the Staff's evaluation of the CPRT Plan, but to issues which are clearly relevant and material to the operating license proceedings as well, and therefore are also relevant and material to CASE.

The inaccessibility of relevant data by visual reinspection dooms the Applicants' current proposal to prove the safety (or non-safety) of the design and construction process at Comanche Peak to failure and therefore renders the proposal moot.

CASE suggests that two alternatives present themselves:

1. Change the objective of the visual reinspection program to determine the status of the original QA/QC program. This would promote those attributes deemed to be "other" by Applicants to be very important. For example, if spatter were found at this stage, when it was a requirement to remove all spatter during the

/3/ This is of special concern to CASE, however, because to our knowledge a similar situation occurred recently where the intervenor in the South Texas operating license proceedings was not notified of, and was initially barred from attending, a vitally important meeting with applicability to the South Texas proceedings. (The intervenor was finally, after much discussion, allowed to have a representative at the meeting.)

original inspection, the significance of the finding is obviously much more important than any original finding would have been. In fact, the importance of all of the attributes would be promoted in like fashion, including those attributes not mentioned by the Applicants.

It would also be necessary to establish a category corresponding to a discontinuity (as defined in the 1984 Welding Handbook, Seventh Edition, Volume 5, page 321, as previously discussed). This category would be considered to be significant in aiding to determine the inadequacy of the original QA/QC program.

This is one of the alternatives that could be chosen, but CASE does not recommend this approach. CASE finds itself in the position of having Applicants argue that the NRC Staff and the Licensing Board (ASLB) should disregard the samples which CASE has already presented to the ASLB and adopt instead the sampling approach set forth by the Applicants in the CPRT Plan. CASE is of the opinion that the inadequacy of the original QA/QC program has already been firmly established. This opinion is supported by the following statements from SSER No. 11:

> "In summary, the QA/QC Group made a limited inspection of installed QC-accepted pipe supports, electrical hangers, and conduit supports and concluded, in general, that the final QC inspections were inadequate because the frequency of recurring deficiencies identified during the inspection were excessive.
>
> "The QA/QC Group concludes that the most important QA concern resulting from the as-built inspection effort is that QC did not detect and report these obvious nonconforming conditions."

-- from NUREG-0797, Supplement No. 11, Safety Evaluation Report related to the operation of Comanche Peak Steam Electric Station, Units 1 and 2, 3.2 Findings and Summations, 3.2.12 As-Built Issues (Category 8), page 0-19

"The pattern of failures by QA and QC personnel to detect and document deficiencies suggests an ineffective B&R and TUGCO inspection system. This pattern, coupled with (a) the past problems in the document control system, (b) deficiencies in the QC qualification program, (c) ineffectiveness of the quality audit and surveillance systems, (d) a rudimentary and ineffective trending and corrective action system, (e) QC problems as shown in QA/QC Category 8, AQ-50; and (f) instances of improper workmanship of hardware as found by all of the TRT groups, challenges the adequacy of the QC inspection program at CPSES on a system-wide basis.

"Corrective action will require high-level management attention and a new management emphasis on the importance of quality as a vital element of an adequate construction program."

-- from Id., 4.9 Overall Assessment and Conclusions, page P-35

However, in the event that this approach is finally decided upon over CASE's strong objections, CASE will proceed to insist upon minimum criteria. For example, CASE does not object to the concept that welding (or other items) cannot rationally be reinspected to more stringent criteria than that criteria which was supposed to have been utilized during original inspection -- IF all of the more stringent criteria, considered either singly or collectively, have absolutely NO safety significance (not CPRT definition). However, if any attributes exist that were not originally checked or if the original inspection omitted some criteria that could be safety significant, CASE insists that a

complete reinspection be performed to include these factors. Moreover, CASE objects to an approach which timidly worries about making sure that the reinspection criteria is less than or equal to the original criteria. This is in direct contrast to the discussion between the CPRT QA/QC leader, Mr. Hansel, and NRC Region IV Regional Administrator Mr. Martin, as may be noted from the following quotations:

> "MR. MARTIN: And again, if I understood you correctly, there is a possibility that you anticipate that the criteria, the inspection criteria, is not likely to be more demanding than the original. And could in some cases be less than (sic) demanding than the original criteria.
>
> "MR. HANSEL: That's correct, sir. We certainly could not go out and inspect that plant today with more stringent criteria than what was applied. That is not a good judgment. We do need to assure ourselves that inherently that these drawing and specs were used for that inspection initially.
>
> "But we can't certainly go out and apply more rigid standards today, unless they have been included in update standards, and in fact applied to that hardware. It's not right to do. It's a very touchy area, and we need to watch that one very close."
>
> -- from Transcript of June 13, 1985, NRC Staff/ Applicants meeting, Volume II, Afternoon Session, pages 201 and 202

It is obviously inadequate to take this polite approach of apparently being reluctant to insult the welds (rather than being concerned about the health and safety of the public).

Further, overpoliteness may have negatively influenced this project since its inception, as may be noted from the quotes from the below-referenced Affidavits from high-level management

officials of Applicants, which were attached to Applicants' response to CASE's discovery requests regarding the deliberate withholding of the MAC Report:

> "I recall discussions in 1978 with P. G. Brittain and R. J. Gary to the effect that the results of the report should not be published or made available generally to employees at the Comanche Peak site or elsewhere. The three of us were generally aware of the possibility that the performance of the review might be taken as an indication that management was critical of the existing TUGCO organization at Comanche Peak. This was not the case and distribution was restricted . . . "
>
> -- from the 8/7/85 Affidavit of Louis F. Fikar, formerly Executive Vice President of Texas Utilities Generating Company (until his retirement 7/1/85) -- (Perry G. Brittain is Chairman and Chief Executive Officer of Texas Utilities Company, formerly President of Texas Utilities Generating Company)

> "At the time it [the MAC audit] was performed, Mr. Brittain, Mr. Fikar, and myself were all concerned about the possibility that the purpose for the MAC review might be misinterpreted by plant employees as indicating that senior management was critical of past performance and this was not the case and for that reason, neither the findings nor the report were publicized and the information regarding the results of MAC's review was made available only to a very few . . . "
>
> -- from the 8/7/85 Affidavit of R. J. Gary, Executive Vice President of Texas Utilities Generating Company

In addition (as previously indicated), it should be taken into consideration that the original inspection appears to have omitted important attributes as described by the codes to which the Applicants were and are committed.

CASE contends that it is necessary to dete mine the collective significance of the shortcomings of each and every

weld. Reliable data from the original inspections should be accumulated for each weld. Reinspection should add additional data by welds. The reinspection data (for most attributes) should be considered to be even more significant than that found originally (e.g., if, upon reinspection, slag or spatter is found, the original inspection should be faulted). Since these occurrences should have been totally cleaned up and not now observable, one can conclude that additional visual discontinuities may have been overlooked. The proper way to account for this is to promote the significance of the reinspection findings.

It is also necessary to collect information regarding the original inspection, such as whether or not: inspection sheets were properly completed; retrievability of complete and accurate data was achieved; QC inspectors have proper qualifications, training, and visual acuity; welders have proper qualifications and training; proper equipment was used; procedures complied with applicable codes, standards, and regulations; proper procedures were used; procedures were followed; dimensions matched drawings; etc.

Further, it is necessary to create an additional subset from both original and reinspection data, segregated by QC inspector to determine the reliability of each inspector, with a similar approach being taken for welders and other participants. If adverse trends are detected, obviously a 100% reinspection of the work of each deficient inspector (or welder, etc.) is necessary.

2. The second alternative is to adopt much more stringent testing methods for the reinspection effort. Since many of the original attributes are no longer testable by visual inspection, other inspection techniques are required. It appears to CASE that only two possibilities exist: (1) destructive testing and/or (2) radiography or possibly both.

From 1984 Welding Handbook, Seventh Edition, Volume 5, Engineering, Costs, Quality, and Safety, page 321, INSPECTION, NONDESTRUCTIVE TESTING, DEFINITIONS AND GENERAL DESCRIPTION:

> "There is considerable overlap in the application of destructive and nondestructive tests. For example, destructive tests or proof tests are frequently used to supplement, confirm, or establish the limits of nondestructive tests, and to provide supporting information."

Another major consideration is proper sample size. To establish the required confidence level it is obvious that samples of samples is inappropriate. Therefore, a reinspection of the total plant is in order, rather than using a so-called representative system.

3. In the event that either of these choices or a less desirable alternative (for the public health and safety) is chosen, CASE wishes to ensure the true independence of this reinspection. At this point in time, it is impossible to claim true independence.

There is no evidence of any independence criteria such as the independent protocol-controlled effort applied to Cygna or the

criteria suggested by the Licensing Board in its 12/28/83 Board Order (QA for Design). CASE submits that such independence criteria did not exist at the time the CPRT members were employed, nor does it exist today (unless it has been provided to the NRC during a secret meeting to which CASE was not privy). This basic and fundamental failure by Applicants and the NRC Staff has allowed the entire CPRT reinspection effort to become influenced by the same mindset and outlook which has led to the current indeterminate condition of Comanche Peak. CASE submits that, at this point in time, it is too late to instill true independence into the CPRT reinspection effort. For this reason, CASE has no confidence in the results -- whatever they may be claimed to be.

For example, one cannot just say, "It's O.K., fellows, you know how I did it or Westinghouse did it at such-and-such plant; it's going to be all right here too. Trust me." -- which appears to be the present prevalent attitude. CASE insists that the many unique issues which exist at Comanche Peak must also be specifically addressed -- not necessarily adopting some approach which is common to many of the anticipated transients and more permanent CPRT members.

This reinspection relies in part upon either the Applicants' employees or sub-contractors; however, the Applicants cannot be expected to supply self-incriminating evidence which could keep them from obtaining an operating license. There is a special

relationship which exists between the Applicants and their sub-contractors. This special relationship precludes true independent activity on the part of such sub-contractors. The Applicants have, on at least one occasion, argued that this special relationship exists -- the Lipinsky portion of these hearings (Docket -2).

CASE contends that the Atomic Safety and Licensing Board (not the NRC Staff nor the Applicants) should be responsible for the conduct of any reinspection. Finances can be obtained by either substantially increasing the licensing fee of all applicants or by imposing a special fee for this particular applicant.

In addition, CASE maintains that the ASLB should require monthly interim reports by the reinspection team which include summaries of all discontinuities, procedural deficiencies, or other problems. Furthermore, all parties should have access to the raw data in a timely fashion.

Although at this stage CASE cannot provide numerical proof, it is CASE's opinion that the proper sample size would also be 100% for both design, followed by construction. A partial justification for this stance is supplied by the following:

> "Complete inspection is used when weldments of the highest quality are required for critical services."
>
> -- from 1984 Welding Handbook, Seventh Edition, Volume 5, Engineering, Costs, Quality, and Safety, page 320, INSPECTION, PLAN SELECTION

4. CASE finds itself in an urgent situation which requires immediate action on the part of the ASLB, in CASE's opinion. The Applicants are proposing to (and will, if the Board does not take immediate action) destroy the evidence of their fatally flawed design/design QA of pipe supports. They propose to tear down and rebuild -- and thereby destroy the as-built configuration of -- the large-bore pipe supports if they are unable to easily prove (which they obviously cannot) that the original design was adequate.

This situation has become extremely urgent because of the position taken by the NRC Technical Review Team (TRT) in its NRC Staff Evaluation (released in Dallas on 8/13/85). If the Board does not take any action with regard to this particular matter before it either accepts or rejects the Applicants' CPRT Plan, it will be too late to order an inspection and evaluation of the as-built configuration which resulted from the original flawed design because it will have been destroyed.

Further, by this action, Applicants will have removed many of the already-known safety-related design deficiencies identified in the licensing proceedings by CASE, as well as construction deficiencies identified by the TRT (SSER No. 11, pages O-18 and O-19).

The exclusion of this valuable data would undoubtedly skew the remaining sample towards acceptance on false premises. This would also rob CASE and the Licensing Board of valuable evidence relevant and material to CASE's Contention 5.

CASE, in the Motion being sent at the same time as this critique, moves that the Licensing Board order Applicants to preserve the original large-bore pipe supports in a condition which would allow allowing complete verification and testing (e.g., any pipe support removed because Stone & Webster is unable to quickly prove its acceptability by analyses could be used for destructive testing of the welds), and for the purpose of determining their QA/QC status as it relates to Contention 5.