July 22, 1982

MEMORANDUM FOR: Desk Officer, OI:HQ (V-82-011)

FROM: Owen C. Shackleton Jr., Acting Director, OIRVFO

SUBJECT: PALO VERDE - ALLEGATIONS FROM AN ANONYMOUS ALLEGER RE: ELECTRICAL INSTALLATIONS

Background Information

This case was opened on June 9, 1982. Initially the anonymous alleger contacted PATRICIA LEE HOURIHAN, intervenor for Palo Verde. HOURIHAN had the alleger call SHACKLETON long distance at his home in Concord, California from Phoenix, Arizona. The alleger claimed he was a Bechtel Senior Electrical Engineer at Palo Verde. He described the electrical installations as "so much garbage." He made some specific allegations some of which have been looked at as they were the same allegations as received in case V-82-009.

This case is getting more than normal attention because the alleger went to HOURIHAN. She is a very active intervenor and has one of her associates Ms. JILL MORRISON contact my office for a status on all these allegations. Of course I have informed her when the investigation is completed and reported she will have an opportunity to get a copy of any of the documents released to the public.

Case Investigator (CI)

This case is assigned to SHACKLETON with a backup by POWER. SHACKLETON's FTS is 463-3711.

Man Days Forecast

It is my estimate that it will take two investigators 5 work days on the road to cover existing leads plus the time it will take to write the closing document.

Owen C. Shackleton Jr.
Acting Director, OIRVFO

FILE: 5-82-011

Interview of: Mrs. Karen Van Tassell, Manager, Warren House Apt. 1546 W. Pierce St., Phoenix, Az. 8/23/82

LAINE Left 24 June 82 from the apt. development.

Returning to Calif. is what he told them. He was friendly to Mr. and Mrs. Van Tassell

April 20, 1982 moved into these apts.

Had a girlfriend somewhere in the area → (KAREN) FRIEND.

Girlfriend lives in area of 40th & Indian School, Phoenix, Az

He said he was going to Newport Beach, California. Was working for security for awhile for Broadway before her job.

That is what he told them when he left.

He drove a 1980 Cadillac Seville, Blue car. Had Calif. plates # 841 WVW.

(Drivers Lic. C16 32286
1984 Calif. Drivers Lic)

Warren House Apartments is where he last lived in Phoenix.

29th and Camelback is P.O. covering the Warren House Apts.

SS# 255-19-8645
DOB 7-17-50

Anthony is from San Onofre, Calif.

This is according to the application he filled out at the Warren House Apartments

Apt. #69, was his apt.

Friends: PAT DUFFY
TOM THESLERIOUS x764 → 877

Both down at: 714/496-1000

They haven't heard from LAINE since he left.

(See Attached for Leads)

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FILE 5-82-011

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8/23/82 – I checked the January, 1982 Phoenix Tel. Directory and there was no listing for KAREN FRIEND or anything close such as K. FRIEND, ___ K. FRIEND, etc.

Owen C. Stackleton Jr.

5-8. 5-

FTS Operator
261-3900
Call to MARION

8/23/82

Review of file on 8/23/82

Names of persons to interview regarding anonymous allegation on eletrical

VED ARORA, Eletrical Engineer for Bechtel. tel x 2049

JOHN HECK, " " " " Badge 0107 - Dept

ANTHONY LANE, " " " "

CARL FISHMAN, Mechenical Engineer for Bechtel on swing shift

ANTHONY W. LAINE, a former Field Electrical Engineer, worked on Unit #2

This is probably the same person the alleger identified.

Interview BILL MURPHY, Project Mgr. of Unit 2, who was over LAINE

LAINE was fired on 6/24/82 by MURPHY.

Interview JACK BOMBARD, supervisor over LAINE. Badge 0365, Dept. 02

OK!

S-9. 5-

CASE : 5-82-011 Prepared: 8/-11/82

Concerns of Anonymous Alleger on Electrical

(1) Made generalization the plant is, "so much garbage." Stated all three units were involved. He referred to the electrical installations for the devices that control the reactor, controls for the coolant pumps and controls for the fuel rods. He referred to the 140' elevation for the horseshoe panels in the control room.

(2) Specifically he stated there is 6" required between the Class I and non-class cables in the control panels. He said there is only 1/2" between cables on Units #1 and #2.

(3) He made an unclear allegation of a problem with the wiring underneath the annunciator panels.
Apparently the above problem was reported by the alleger. He wrote an Engineering response by stating they had no problem. He wrote this "probably about 3 months ago" (that would have been in February, 1982).

(4) Claims massive rework is going on because of prior lack of supervision

(5) Claims the diesel generator panels in the diesel room are installed wrong. They were supposed to be bolted to the floor and no bolts were provided. He said this applies to Unit #2. He stated all high voltage panels and control panels in the diesel generator building have to come out because they weren't installed properly.

S-10 S-1

(6) In Unit #1, elev. 120', just after you come up the stairs there is a MCC Center (Motor Control Center), believed to be MO 317.
A young engineer identified #4 or #0 size cables were to be installed.
The vendor put in two #2s on each phase (150 amps)
The young engineer wrote a FCR for #6 (60 to 70 amps). The FCR was written in April, 1981. He claims the cable is too small.
Alleger said the whole unit is like this.
Alleger said he tried to say something about this problem and was told by his management to mind his own business.

Alleger stated he has reported 150 design errors in electrical designs.

(7) CARL FISHMAN, Mechanical Engineer for Bechtel, was put on swing shift because he wants everything done correctly. FISHMAN works on Unit #1. FISHMAN will give specifics.

CPL

Owen C. Shackleton

Case 5-82-011 Prepared: 8/24/82

INVESTIGATIVE PLAN

At PVNGS (Allegation #3)

Locate the NCR written by the alleger in approximately February, 1982 about the wiring underneath the annunciator panels. Engineering stated there was no problem. Review this NCR and determine if there is any need to persue the matter further.

At PVNGS (Allegation #2)

Obtain the NCR from QA or from Case 5-82-009 that identified the problem of the cables not being properly seperated in the control panels in the control room.

At PVNGS (Allegation #5)

Obtain the NCR or other documentation from QA or from Case 5-82-009 that identified the problem of the diesel generator panels being installed differently than the original design.

At PVNGS (Allegation #6)

Obtain the documentation on the MCC, possibly # M0.317, in Unit #1, Elev. 12 just after you come up the stairs that allegedly had too small of cables installed.

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At PVNGS (Allegation #7)

Contact and interview CARL FISHMAN, tel ext. 2361, Mechanical Engineer for Bechtel. He reportedly was put on swing shift in Unit #1 as punishment because he

wanted everything done correctly.

At PVNGS.

Interview JACK BOMGARD, former supervisor over LAINE, to determine why LAINE left and any other data that might shed light on what is behind the allegations.
BOMGARD, Badge # 3680, Electrical, Tel ext. ~~2517~~ 2601
Unit 1 - Gaide trailer - North of Cat ½ Fuel. is his location.

At PVNGS

Interview VED ARORA, Electrical Engineer for Bechtel, tel. x 2[illegible] concerning his knowledge of allegations. Main Construction Bldg. - A[illegible] office is on the main floor by the front double doors.

AT PVNGS

Interview JOHN HECK, Electrical Engineer for Bechtel, Badge [illegible] tel. x 2517 concerning his knowledge of allegations.

At Newport Beach, Calif.

Locate and interview ANTHONY W. LAINE for his comments con[illegible] subject allegations. (See page 2 of Serial 9 for obvious leads to locate.

Cleon C. Blackb[illegible]

FILE: 5-82-011 8/23/82

To locate and interview LAINE the following can be done in order of easiness:

At Southern California

By telephone call LAINES two friends to get his present address:

PAT DUFFY (714) 498-1000 EXT. 877

TOM THESLER LLOOS (guess) (714) 498-1000 Exts. 964

At Phoenix, Arizona

Locate LAINES' girlfriend, KAREN FRIEND. From her determine L... current whereabouts.

She can be located by:

(1) Check telephone directory (She is believed to live in the area ... 40th & Indian School.

(2) She last worked for Broadway in their security dept. in Ph... Contact Broadway and get identifying info on her and possibly present place of employment and her last known address

At Sacramento, Calif.

Through the DMV see what the latest info is on LAINE.

His drivers lic in Calif is C16 32286.

His Calif. plates are 841 WVW.

CASE: 5-82-011 — Unit 2 Lead Tech & Civil Engineer. - Bechtel — 8/24/82

Interview of JACK T. BOMBARD @ PVNGS in Res Inspectors Office, Construction Bldg.

(Has cables and cable terminations)

LAINE – He was Comm. Eng. in Unit 2, working for Bechtel

LAINE – He had the control Bldg. and Diesel gen. bldg. responsibilities

Indirectly reported to JACK BOMBARD.

He Reported directly to JOHN HECK, Lead Field Engineer. HECK reports to BOMBARD.

Doesn't remember the specific NCR the alleger spoke of concerning the annunciator panels.

HECK would probably see LAINE'S NCRs. Might not see everyone. They don't do NCRs their people submit, but try and make it easy for all of them to write NCRs.

They referred to LAINE as "Sky King" as a nick name. He was given this nickname the men he worked with considered him as being "Flaky" and not a reliable person as to his personal claims

Claimed he was a degreed engineer. Bechtel has since found

Did a check and they found he was not known to the college where he came from.

Ph.D.

Into where he was supposed to be working on his degree they didn't know LAINE. (Co

There were reasons contributing to his being fired. They weren't pleased with h performance. Nothing extremely bad, but they just didn't have confidence in him.

LAINE was a hyper individual. Wouldn't be surprised if he was on something. However, he actually saw him or heard from others that he was taking any drugs.

Doesn't know where he is now. Recalls he said he was going to work on computers for use out on the oil rigs.

5-12 5-1

LAINE never worked in Unit #1. FCRs in some cases refer to more than one unit. Maybe he got the info from the FCR that referred to all units, but the

CASE: 5-82-011 (Interview of BOMBARD, Cont'd) 8/24/82

13EM306 is what he thinks the FCR the alleger ~~made~~ spoke to that was written by a young engineer.

LAINE was a job shopper at SONGS. He was hired by Downey not by BOMBARD and was sent to work for BOMBARD. BOMBARD did get a look at his alleged credentials.

BILL MURPHY is the one who terminated LAINE. He did this because of his job responsibility called for him to terminate engineers. MURPHY did not have first hand daily supervision responsibilities over LAINE.

BOMBARD said that many of the problems reported by LAINE they later learned were initially identified to LAINE by journeymen electricians.

BOMBARD stated he is proud of the job they are doing and feels the electrical installations are very good. He does not share the alleger's concerns.

BOMBARD on 8/25/82 advised he has been in construction work for 15 years. He has worked on nuke projects for a total of 7 years. He was on DAVID BESSIE before he came to PVNGS.

CAE-5-82-011 8/24/82

Interview of

VED ARORA, SR. Electrical Eng., Res. Eng. Staff, Bechtel @ PVNGS

tel ext #2049

Talked to LAINE a few times.

He brought problems a few times to ARORA.

LAINE came to him on the sep. problems on control panels

He told him the criteria had been revised and that they will be changed so the separations meet the new criteria.

In ARORA's opinion LAINE was not technically

He didn't know of sep. problems for cabling under the annunciator panels.

LAINE Never discussed the 150 design errors with ARORA. that LAINE reportedly identified.

It did not appear LAINE ~~did not~~ had the technical ability he claimed to have.

Criteria was changed approx. 1½ to 2 mos. on the sep. of cables.

ACTION — ARORA will get us documentation on the change of the cable separation.

He feels they are doing a very good job on their electrical installations and does not share the allegers concerns.

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CASE: 5-82-011 8/24/82

Interview of JOHN S. HECK, Sr. Construction Engineer (Lead Termination Engineer for Bechtel

x4217 (SW corner 6 wide trailer)

About the beginning of May, 1982 LAINE did not follow instructions given by HECK to show mgt. members sep. problems at Unit #1. HECK had to take them back and show these engrs the problems.

LAINE was no good. He was a liar. He was not competent to perform his engineering job.

G-C would find items bought off by LAINE.

He created a morale problem for HECK's work force. Because he was so poor at his job and others soon knew it. They know he was getting top wages and couldn't do the job.

HECK was on his back all the time. And after awhile LAINE told HECK he was going to resign. He did submit his resignation several weeks before he was fired. He gave the reason for resignation as the uncooperativeness of the field engineers. Mgt. refused to accept his resignation so he did not leave at the

MURPHY called the University and determined they had no record of LAINE. When LAINE was confronted with this information by MURPHY he said he had his degrees at home. MURPHY fired him at that time. MURPHY had university send him a letter stating they had no record of LAINE.

There was a problem in a MCC cell in Unit #1.

DCP was written against all 3 units. It came out in Sept, 1981.

A young engineer wrote the FCR for Unit #1.

LAINE wrote a FCR for Unit #2 for all 3 units concerning changing the breaker boxes and size of cables in the cells of the MCC. HECK coached him thru writing the FCR.

LAINE was only here approx. 6 months before he was fired.

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HECK was building a case against LAINE to get him fired. HECK had the concurrence of

boss, BOMBARD, BOMBARD's boss BOB HART and their Project Manager. BILL MURPHY. MURPHY wrote a two page letter to their HQ at Downey to get LAINE fired and it was denied. MURPHY then went to personnel and got LAINE's personnel folder and started a background investigation. He learned from the university where LAINE had claimed to have obtained his degrees that they had never heard ~~[illegible]~~ of him.

Concerning the routing and separation of cables HECK explained that originally they could have two cables within one inch of each other as long as one was enclosed. Then they had a change requiring cables that close to each other both had to be enclosed. This was impossible to do because of some of the spaces where cables were already installed without a very expensive retrofit program. Therefore, they changed the system back to the way it originally was.

HECK stated LAINE was a liar and cited an example. One day HECK was in the field checking the work and observed a QCI hanging red tags on some Class 1E cables. HECK questioned the QCI why he was red tagging these cables and the QCI showed him that seven (7) of these cables had cuts clear through the covering material to the depth that these cut ends of the cables did have to be removed. These installation of these cables was signed off as okay by LAINE. HECK [illegible] paperwork showing the seven cables had cuts and gave them to LAINE and asked him what about this. LAINE said it couldn't be and HECK told him to go out and check the cables. LAINE did go out and when he returned he told HECK there were only two cables that were cut. HECK in addition to the QCI carefully examined the subject cables and there were seven with the semiconductor layer cut which you could see if you examined the surface of the cables.

HECK while only 28 yrs. old said he started working in construction when he was 13 yrs old. He has been in the industry for 15 years ~~old~~ He worked at Millstone for 2 yrs. He has been at PVNGS

Carter C. Shacklett Jr.

CASE: 5-82-011

8/24/82

NCR #	DATE PREP / ISSUED	ITEM	CLASS	UNIT	DESCRIPTION
E.J. 1880	3-2-82 / 3-3-82	13.EM.017R4	Q	3	Sep. of cables

Ved ARORA 12:05 pm. for interview this date.

These are notes from review of the NCR Log at the vault at PVNGS.
We were attempting to identify an NCR written by LAINE on separation problems of cables.

DESIGNATIONS FOR PANELS 8/24/82

13-J-RMN(A)(B)(C)(D) - B01

THRU B07

~~13-J-RKN(A)(B) - UA -~~

Annunciators:

1-J-RKN-UA-1A, 1B, 1C.

1-J-RKN-UA-2A, 2B

~~1-J-RKN-UA-2C, 2D, 2E, 2F~~

1-J-RKA-UA-2C ~~2B~~

1-J-RKB-UA-2B D

8/24/82 Obtained from LOU VANDENBRUEGGEN

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Comsip, inc.

1418 E. Linden Avenue
P.O. Box 152
Linden, NJ 07036
(201) 486-1272
Telex 13-8496

10650 E. Rush Street
South El Monte, CA 91733
(213) 442-0882
Telex 67-4768

March 24, 1982
Letter #AR-1299

Bechtel Power Corp.
11445 S. Lakewood Blvd.
Downey, CA 90241

Attention: W. G. Bingham
Project Engineering Manager

Reference: Bechtel PO #10407-13-JM-200
Comsip SO #5875

Subject : Bechtel Deficiency Evaluation Report No. 81-53, Rev. 0 (Bechtel NCR'S #1668 and 1669)

Correspondence Reference: Bechtel Letter #B/CC-E-38291, MOC 183669, dated 1/29/82

Gentlemen:

Below is Comsip's response to your letter and reports referenced above:-

Non-conformance Report No. E-C 1668

A field trip was conducted on March 10, 1982, by our Mr. Y. Harpaz, to check for non compliance referred to in the report.

A careful inspection of all panel sections conducted with Bechtel field personnel and engineers found that except as detailed below, non compliance was not due to Comsip installation.

There may be a possible deviation from the separation requirements by wires installed on panel sect. B06, near the Foxboro Miniature Recorders 1J-RJN-UJR-168 and 1J-CDN PR49/47 due to proximity to cable connectors.

The field signal cable to the above 2 recorders may require an addition of a barrier in order to comply with the separation requirements.

We will accept to our account a field charge for the required labor to install the 2 barriers, should it become necessary.

Non-conformance Report No. E-C 1669

A field trip was conducted on March 10, 1982 by our Mr. Y. Harpaz, to check for non compliance referred to in the report.

A careful inspection of all panel sections conducted with Bechtel field personnel and engineers, found no area of non compliance. The wires and cables of different channels were adequately separated in conformance with the specification requirements.

Since all theee units are intended to be identical (with few exceptions) it is assumed that any non compliance found to exist in the Unit 1 panels will also be found in the panels fabricated in Unit 2 and 3.

Therefore, while the Unit 3 Main Control Room Panels are still under construction, any wiring non compliance noted in referenced DER will be corrected before shipment of the Unit 3 panels to the jobsite.

Conditions of non compliance existing in the Unit 1 & 2 Main Control Room Panels must, of course, be corrected at Consip's expense, as noted per our response to NCR'S #1668 and 1669 above.

The field signal cable to the above 2 recorders may require an addition of a barrier in order to comply with the separation requirements.

We will accept to our account a field charge for the required labor to install the 2 barriers, should it become necessary.

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Conditions of non compliance existing in the Unit 1 & 2 Main Control Room Panels must, of course, be corrected at Comsip's expense, as noted per our response to NCR'S #1668 and 1669 above.

TK

I trust that you will find our investigation and response to this matter satisfactory.

Very truly yours,

COMSTIP INC.,
CUSTOMLITHE DIVISION

K. Kopans,
Project Manager

KK/ss

CC: R. Sylvester - CICD
Y. Harpaz "
D. Rankin "
C. Ferdinand "
E. Walinski "
J. Ingram "
M. Batson "

E.E, Van Brunt, Jr. - Bechtel (Downey)
B. Rhodes " "
S. Bagga " "
D. Souteropoulis " "
D. Guidetti " (Palo Verde)
W. Kerrigan " (In-House) SQR

Bechtel Power Corporation

Interoffice Memorandum

To W. J. Stubblefield

Subject ANPP Job 10407
Electrical Separation in
Main Control Board

File No. E.11.03
IOM-E-9637 MOC 191507

Date March 23, 1982

From W. G. Bingham

Of Engineering

At LAPD Ext. 539

Copies to W. R. Wilson
F. Herman
R. R. Stiens
K. Soteropoulos
T. E. Hartman
V. Arora
All w/encl.

This will inform you that Engineering has performed a field walkdown to inspect Electrical Separation Problems in Unit 1 Main Control Boards as a result of Field Memo RE-056, dated October 14, 1981.

Project criteria for wire/cable safety separation is based on meeting Regulatory Guide 1.75 and is noted specifically in Specification 13-EM-306, Section 11.0. A minimum of six (6) inches between redundant Class IE field cables or internal redundant Class IE wiring is required when relying on air separation. The safety separation may be reduced to one (1) inch (wire to barrier) if acceptable barriers are utilized. Please be advised that as a result of the field inspection, non-compliances to this criteria were discovered.

To date, only an advance copy of NCR EC-1668, which addresses separation in Main Control Boards but doesn't include all the non-compliances cited during the field walk, has been received by Engineering. Specifics determined at the time of walkdown are enclosed for your information with Electrical's input provided to aid in determining formal dispositions. For cases where separation non-conformances have not been included in NCRs written to date it is suggested that the field perform the necessary modifications with consent of vendor in order to fix the separation deficiencies or issue appropriate NCRs for specific dispositioning.

We would also like to advise that special precautions be taken to avoid similar separation problems in Units 2 and 3 implementations.

D W Keith for
W. G. Bingham

WGB:ST:lcc

Enclosure: Separation Non-Conformances in MCB (15 pages, 1 copy)

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FINAL REPORT - DER 81-53

DEFICIENCY EVALUATION 50.55(e)

ARIZONA PUBLIC SERVICE COMPANY (APS)

PVNGS UNIT 1

I. Description of Deficiency

During a termination walkdown inspection, the Main Control Panel wiring was found to be in violation of IEEE-384-1974.

- NCR EC-1669 identifies Comsip, Incorporated installed internal wiring which has bundled Class 1E wires (red and green) with Non-Class 1E wires (black). This particular condition, however, is attributed to the Bechtel installation of Foxboro Miniature Records and shelf after Panel B06 had been delivered to the jobsite.

- NCR EC-1668 identifies several termination/routing conditions completed by Bechtel Construction in violation of separation requirements. This condition was discovered when the wiring was inspected to a later revision of the Installation Specification 13-EM-306. Revision 5 of this Specification clarified separation and routing requirements for these particular applications.

II. Analysis of Safety Implications

This condition is evaluated as Reportable under the requirements of 10CFR50.55(e). Electrical isolation and separation were inadequate to assure that failure in one circuit would not cause failure in an adjacent safety-related circuit.

III. Corrective Action

NCR EC-1669 will be dispositioned to provide the addition of a barrier as directed by letter Comsip, Incorporated #AR-1229, dated March 23, 1982, copy attached.

NCR EC-1668 will be dispositioned to provide electrical separation and barriers as directed by Bechtel IOM-E-9637, dated March 23, 1982, copy attached.

Installation Specification 13-EM-306, Revision 5, was issued on October 7, 1981. This revision provides additional instruction and direction for compliance to IEEE-384-1974.. Compliance with this Specification will preclude recurrence for Units 2 and 3.

10.3 600 Volt Control and Instrumentation Cables

10.3.1 When control and instrumentation cables enter an equipment cabinet, panel, or terminal box through a floor slot by means of cable tray, cables shall be supported appropriately. For reference see Figures 16 and 17.

10.3.2 When control and instrumentation cables enter an equipment cabinet, panel, or terminal box through a conduit riser, cable shall be supported by cable ties after cable leaves the conduit (see Figure 17).

10.3.3 (Deleted)

10.3.4 Field shall train the cables inside cabinet, panel or terminal box and shall provide auxiliary supports as required to ensure that cable weight is not supported by the wire terminations. See Figure 16. Field installed auxiliary supports shall be TY-RAP Base Type (or equal) fastened with machine screws or self-tapping screws (1/4-inch maximum), or use snap-in base type.

Horizontal runs of field cable in the main control boards will be tied to the board floor plate at intervals not to exceed 4 feet. Field installed horizontal auxiliary supports shall be TY-RAP Base Type (or equal) fastened with machine screws or self-tapping screws, or use snap-in base type.

10.3.5 Cable within slot and equipment shall be protected from sharp edges or projections using edge protectors (Globe DSP) during and after installation. (See Specification 13-EM-034, Item No. 81.)

10.3.6 The minimum bending radius for coaxial cable under permanently trained conditions within equipment cabinets, terminal boxes or pull boxes shall be maintained so as to comply with the cable manufacturer's requirements for cable installation.

11.0 SEPARATION REQUIREMENTS FOR FIELD CABLING WITHIN ENCLOSURES

11.1 The minimum separation distance between redundant safety-related Class IE separation group (A, B, C, or D) wiring internal to control switchboards, equipment cabinets, panels, or terminal boxes shall be 6-inches minimum. The minimum separation distance between field cables/wiring and internal redundant Class IE wiring shall also be 6-inches minimum. Redundant safety-related separation groups are defined as follows:

Separation Group A: Channel A or Train A
Separation Group B: Channel B or Train B
Separation Group C: Channel C
Separation Group D: Channel D

Where a 6-inch minimum physical separation between two redundant safety related separation groups cannot be maintained, one of the following shall be provided (see Figures 18 and 19):

a. The cables of the redundant safety-related separation groups must be installed in enclosed raceways (rigid conduit, EMT, enclosed metallic gutter, or flexible conduit). Minimum spacing between enclosed raceways of redundant separation groups shall be 1 inch. The enclosed raceway shall be installed over the entire length of the cables or cable conductors from/to the point where a 6-inch minimum separation distance can be established (e.g., from the point of entry into the cabinet to the point of termination of the cable conductor as shown in Figure 18).

b. A metal barrier shall be erected between the cabling, terminal blocks, or components of the redundant safety-related separation groups. A minimum separation of 1-inch air space shall be maintained between the barrier and the cable, terminal blocks, or components. The barrier shall extend a sufficient distance beyond the outer edge of the separation group cable or cable bundle such as to allow a minimum of 6-inches air space between cables or redundant separation group. (See Figure 19b.)

c. (Deleted)

11.2 (Deleted)

11.3 When Non-Class IE cables enter an enclosure with Class IE wiring (field cabling or internal cabinet wiring), a 6-inch minimum physical separation shall be maintained between the Non-Class IE cables and any Class IE wiring. (See Figure 19a.) Where a 6-inch separation cannot be maintained, the Non-Class IE wiring shall be installed in enclosed raceways (rigid steel conduit, flexible conduit, EMT, or enclosed metallic gutter), and a minimum 1-inch separation shall be maintained between the Non-Class IE enclosed raceways and the Class IE cables (See Figure 19c) or installed as described in 11.1b.

11.4 (Deleted)

11.5 Installation of flexible conduit shall be as described in 11.1 and 11.3 and as follows:

5| a. Apply flexible conduit.

3| b. Use insulated flexible conduit, Anaconda type NWC (Specification 13-EM-036A) or apply fire retardant tape (Plymouth No. 3318) over the flexible conduit with one layer minimum at half overlap and secure with glass tape (Plymouth No. 3456) with one layer minimum at half overlap. (See Specification 13-EM-106C.)

c. After all fire proofing material has been applied, identify the cables and each conductor as discussed in Specification 13-EM-303.

5| d. (Deleted)

1| e. Provide support for the flexible conduits where required.

11.6 For power cable only, one end of the flexible conduit shall be grounded to the cabinet, panel, or terminal box ground system (see 9.1.2).
5| To prevent flexible conduit from slipping tie to metal support with tie raps.

11.7 Where enclosed raceway (excluding flexible conduit) or barriers are used to comply with 11.1, 11.3 or 11.4 and addition of said raceway or barrier requires support from or attachment to a Supplier furnished cabinet, panel, or box, approval via FCR shall be obtained from project engineering prior to proceeding with installation.

11.8 Separation between Non-Class IE field cables and Class IE internal wiring of isolation devices shall be as shown in Figure 26. The separation of the wiring at the input and output terminals of the isolation device may be less than 6 inches provided it is not less than the distance between input and output terminals of the isolation device.

5| 11.9 For internal wiring of cabinets, adherenace of vendors to the general principles of section 11 will be considered acceptable to meet the separation requirements of IEEE 384-1977 and Regulatory Guide 1.75.

Note: Discrepancies by vendors to sectior 11 should be documented with non conformance reports for vendor disposition and brought to the attention of the electrical discipline.

12.0 CABLE REPAIR

12.1 Cable repair is not permitted on cables used for Class IE circuits.

3| 12.2 Cable jacket repair is permitted on cables used for Non-Class IE circuits provided Nonconformance Report (NCR) is issued. Where the cable is to be repaired, field shall use Raychem JRS or WCSF sleeves as applicable. Other methods shall be approved by Project Engineering on a case-by-case basis.

See next page

continued on page 22A

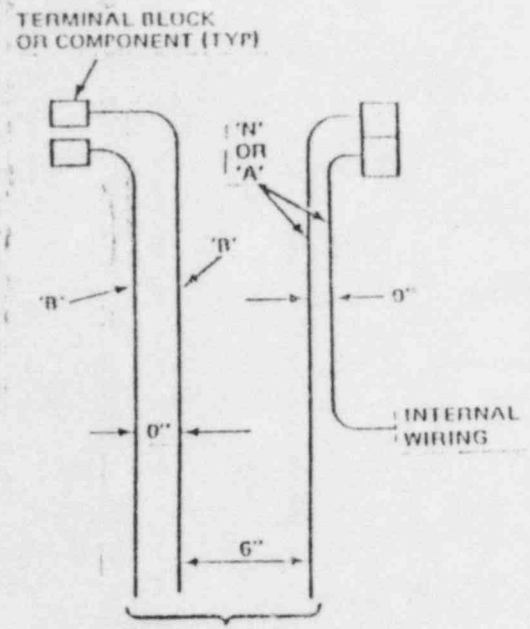


FIGURE 19A

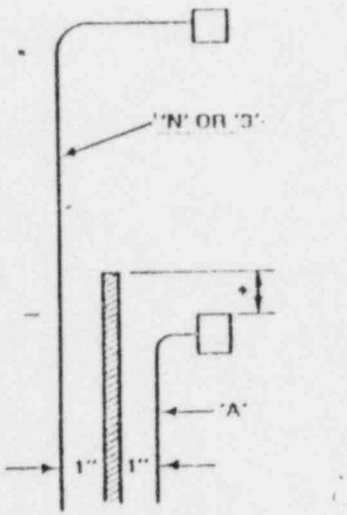


FIGURE 19B

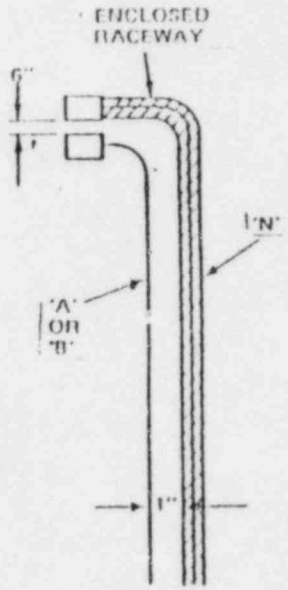
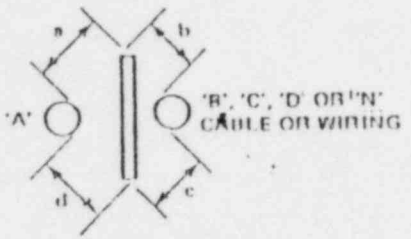


FIGURE 19C

NOTES:

1. ALL DIMENSIONS ARE MINIMUMS.
2. ALTHOUGH THE MINIMUM DIMENSIONS SHOWN ARE ACCEPTABLE, THE MAXIMUM PRACTICAL SEPARATION SHOULD BE GIVEN.
3. 'A' AND 'B' INDICATE CLASS 1E SEPARATION GROUPS. WHILE 'N' INDICATES NON-CLASS 1E CIRCUITS.
4. MINIMUM DIMENSION IS THAT DIMENSION REQUIRED TO MAINTAIN 6" SEPARATION. (a + b = MIN 6" AND c + d = MIN 6")
5. 'A', 'B' OR 'N' SEPARATION GROUPS ARE SHOWN TYPICALLY AND ARE INTERCHANGEABLE OR REPLACEABLE BY 'C' OR 'D' SEPARATION GROUPS.



SINGLE BARRIER

PHYSICAL SEPARATION OF CLASS 1E FIELD CABLE CIRCUITS INSIDE CONTROL SWITCHBOARDS, CABINETS, AND PANELS.

FIGURE 19

13-EM-306

LOS ANGELES POWER DIVISION

DEFICIENCY EVALUATION REPORT

10 CFR 50.55(e)
AND/OR
10 CFR PART 21

1. REPORT NO. 81-53
REV. NO. 0
DATE 12/17/81
PAGE 1 OF 1

2. PROJECT - NAME/JOB NUMBER	3. UNIT	4. Q CLASS	5. REFERENCE DOCUMENTS
PVNGS/10407	1	Q	NCR's EC-1668/1669

6. SEISMIC CATEGORY	7. HOW DISCOVERED
1	By Termination Engineer/Walkdowns

8. REQUIREMENT

Specification 13-JM-200

9. DESCRIPTION OF CONDITION

Main Control Panel wiring is installed in violation of IEEE 384-1974.

- NCR EC-1669 identifies vendor installed internal wiring has bundled Class IE wires (red & green) with Non-Class IE wires (black).
- NCR EC-1668 identifies Bechtel Construction termination/routing of cables and wires in violation of separation requirements.

Notification

10. REPORT INITIATOR
C. Gaither

11. QA VALIDATION OF BLOCKS 1-10
D. R. Stevenson 12/17/81 DATE 11:00 AM TIME

12. QA ~~DELIVERY~~ OF DER TO:

R. Stiens (PROJ ENG)	12/17/81 DATE	1: TIME
J. D. Houchen (PROJ MGR)	12/17/81 DATE	1: TIME
R. L. Patterson (QA SUPERVISOR)	12/17/81 DATE	2: TIME

13. PRELIMINARY EVALUATION

POTENTIALLY REPORTABLE: YES ☒ NO ☐

R. A. Stiens 12/29/81 PROJ ENG/DATE
W Hubbard 12/ PROJ MGR/DATE

DATE CLIENT NOTIFIED 12/30/81 (G.H. Duckw

14. FINAL EVALUATION

REPORTABLE 10CFR 50.55(e): YES ☒ NO ☐
REPORTABLE 10CFR21: YES ☐ NO ☒
10CFR21 REPORT BY _____

R. A. Stiens 4/7/82 PROJ ENG/DATE
W Hubbard 4/5/82 PROJ MGR/DATE
QA CONCURRENCE 4/6/

15. VERIFICATION OR CORRECTIVE ACTION

TRANSFERRED TO NCR/CAR

D. R. Stevenson QA
4/7/82 DATE
☒ ACCEPTED ☒ NO. NCR's EC-1668/1669

16. DISTRIBUTION LIST

- ☒ PROJ. MGR.
- ☒ SITE CONST. MGR.
- ☒ QA SUPERVISOR
- ☒ PROJ. ENGR.
- ☒ PROJECT QE
- ☒ PROJ. PROC. MGR.
- ☒ EVALUATION COMMITTEE
- ☒ CLIENT
- ☐ PROJ. DOC. CENTER
- ☒ MGR. OF QA

OTHERS
- ☒ A. K. Priest
- ☒ F. S. Trotter
- ☐ _____

PROJECT FILE

LOS ANGELES POWER DIVISION

PALO VERDE NUCLEAR GENERATING STATION
PROJECT EVALUATION –
DEFICIENCY EVALUATION REPORT
JOB NO. 10407

REPORT NO. 81-53
REV./DATE 0 4/2/82
PAGE 1 OF 2

PREPARED BY	Q. CLASS	UNIT	REFERENCE DOCUMENTS
K. Stwertnik (NAME) 4/2/82 (DATE)	Q	1	NCR's EC-1668/1669 Specification 13-JM-2(

PART 21 REPORTABILITY: IF THE ANSWER TO ANY OF THESE CRITERIA (SEE PQPM 16.2 FOR DEFINITIONS) ARE NO THEN THE CONDITION IS NOT REPORTABLE UNDER PART 21.

1. DOES THE DEFECT EXIST IN A BASIC COMPONENT? ☒ YES ☐ NO
2. DOES THE DEFECT PRESENT A SUBSTANTIAL SAFETY HAZARD? ☒ YES ☐ NO
3. HAS THE COMPONENT BEEN DELIVERED OR OFFERED FOR ACCEPTANCE? ☐ YES ☒ NO

PROJECT EVALUATION ☐ INTERIM REPORT ☒ 50.55(e) FINAL REPORT ☐ PART 21 REPOR

I. CONDITION DESCRIPTION

During a termination walkdown inspection, the Main Control Panel wiring was found to be in violation of IEEE-384-1974.

- NCR EC-1669 identifies Comsip Inc. installed internal wiring which has bundled Class IE wires (red & green) with Non-Class IE wires (black). This particular condition however, is attributed to the Bechtel installation of Foxboro Miniature Recorders and shelf after Panel B06 had been delivered to the jobsite.

- NCR EC-1668 identifies several termination/routing conditions completed by Bechtel Construction in violation of separation requirements. This condition was discovered when the wiring was inspected to a later revision of the installation specification 13-EM-306. Revision 5 of this specification clarified separation and routing requirements for these particular applications.

II. ANALYSIS OF SAFETY IMPLICATIONS

This condition is evaluated as reportable under the requirement of 10CFR50.55(e) Electrical isolation and separation were inadequate to assure that failure in one circuit would not cause failure in an adjacent safety related circuit.

III. CORRECTIVE ACTION

NCR EC-1669 will be dispositioned to provide the addition of a barrier as directed by letter Comsip Inc. #AR-1299 dated 3/23/82.

NCR EC-1668 will be dispositioned to provide electrical separation and barriers as directed by Bechtel IOM-E-9637 dated 3/23/82.

IDENTIFY CALCULATION OR OTHER DESIGN DOCUMENT WHICH WILL BE INITIATED OR REVISED TO SUPPORT THIS EVALUATION.

DOCUMENT TITLE, NUMBER, AND REVISION	FORECAST COMPLETION DATE
Comsip Inc. Letter #AR-1299	3/24/82
Bechtel IOM-E-9637	3/23/82

SAR IMPACT ☐ YES ☒ NO

NGS 4/2/82 DATE

PEM EVALUATION AND REPORTABILITY RECOMMENDATION

PEM 4/2/82 DATE

☒ REPORTABLE
☐ NOT REPORTABLE

PF-3186 (10407) 10/80

Comsip, inc.

1418 E. Linden Avenue
P.O. Box 152
Linden, NJ 07036
(201) 486-1272
Telex 13-8496

TK

10650 E. Bush Street
South El Monte, CA 91733
(213) 442-0882
Telex 67-4768

March 24, 1982
Letter #AR-1299

Bechtel Power Corp.
11445 S. Lakewood Blvd.
Downey, CA 90241

Attention: W. G. Bingham
Project Engineering Manager

Reference: Bechtel PO #10407-13-JM-200
Comsip SO #5875

Subject : Bechtel Deficiency Evaluation Report No. 81-53, Rev. 0 (Bechtel NCR'S #1668 and 1669)

Correspondence Reference: Bechtel Letter #B/CC-E-38291, MOC 183669, dated 1/29/82

Gentlemen:

Below is Comsip's response to your letter and reports referenced above:-

Non-conformance Report No. E-C 1668

A field trip was conducted on March 10, 1982, by our Mr. Y. Harpaz, to check for non compliance referred to in the report.

A careful inspection of all panel sections conducted with Bechtel field personnel and engineers found that except as detailed below, non compliance was not due to Comsip installation.

There may be a possible deviation from the separation requirements by wires installed on panel sect. B05, near the Foxboro Miniature Recorders 1J-RJN-UJR-168 and 1J-CDN PR49/47 due to proximity to cable connectors.

I trust that you will find our investigation and response to this matter satisfactory.

Very truly yours,

COMSIP INC.,
CUSTOMLINE DIVISION

K. Kopans,
Project Manager

KK/ss

CC: R. Sylvester - CICD
Y. Harpaz "
D. Rankin "
C. Ferdinand "
E. Walinski "
J. Ingram "
M. Batson "

E.E, Van Brunt, Jr. - Bechtel (Downey)
B. Rhodes " "
S. Bagga " "
D. Souteropoulis " (Palo Verde)
D. Guidetti " (In-House) SQR
W. Kerrigan

PALO VERDE NUCLEAR GENERATING STATION
UNITS 1, 2 & 3
SPECIFICATION CHANGE NOTICE
(SCN)

PROJECT FILE !

SPECIFICATION NO	REV	SCN NO
13-EM-306	5	3119

QUALITY CLASS Q

JOB NO 10407 SHEET 1 OF 4

DATE: 7/22/82 BY: H. Nabili

CHANGE REQUESTED BY: ☐ CLIENT ☒ ENGINEERING ☐ FIELD ☐ SUPPLIER/CONTRACTOR

REASON FOR CHANGE: To eliminate unnecessary conservatisms from specification

Reference: ANPP-21416-JTB/MLH, July 16, 1982.

DESCRIPTION OF CHANGE THIS SCN SUPERCEEDS SCN# 3070

See attached

RECEIVED
AUG 3 - 1982
CONSTRUCTION
PVNGS

* USE ADDITIONAL SHEET IF NECESSARY OR ATTACH COPY OF REVISED SPECIFICATION PAGES. 7-28-82

MATERIAL PROCUREMENT RESPONSIBILITY	AFFECTED PURCHASE ORDERS	PM OR MR PREPARED FOR SCN CHANGE YES	NO
☐ BECHTEL OFFICE ☐ SUPPLIER/CONTRACTOR ☐ BECHTEL FIELD ☒ NONE REQUIRED	N/A		✓

BECHTEL ENGINEERING ☒ APPROVED ☐ DISAPPROVED

[signature] 7/21/82 [signature] 7-28-82
GROUP SUPERVISOR DATE NUCLEAR GROUP SUPERVISOR (IF REQUIRED)

[signature] 7/27/82 [signature] 7/28/82
PROJECT ENGINEER DATE PQAE (QUALITY CLASS Q AND R SPECS) DATE

REMARKS

ADDITIONAL DISTRIBUTION: ☐ PROJECT PROCUREMENT MANAGER ☐ COST TREND ENGINEER S-18

INSERT B

SCN# 8119

Where a 6-inch separation cannot be maintained either the non-Class 1E cable or the Class 1E cable will be installed in enclosed raceways (rigid steel conduit, flex conduit, EMT, or enclosed metallic gutter) and a minimum of one-inch separation is maintained between the enclosed raceway and the non-enclosed cables (see figure 19C) or installed as described in 11.1b. If the Class 1E cable is enclosed in an enclosed raceway then the non-Class 1E cable that is routed within 6-inch of that raceway will not be routed within 6-inch of any other Class 1E separation group within the enclosure.

SCN #311

Where a 6-inch minimum physical separation between two redundant safety related separation groups cannot be maintained, one of the following shall be provided (see Figures 18 and 19):

a. The cables of the redundant safety-related separation groups must be installed in enclosed raceways (rigid conduit, EMT, enclosed metallic gutter, or flexible conduit). Minimum spacing between enclosed raceways of redundant separation groups shall be 1 inch. The enclosed raceway shall be installed over the entire length of the cables or cable conductors from/to the point where a 6-inch minimum separation distance can be established (e.g., from the point of entry into the cabinet to the point of termination of the cable conductor as shown in Figure 18).

b. A metal barrier shall be erected between the cabling, terminal blocks, or components of the redundant safety-related separation groups. A minimum separation of 1-inch air space shall be maintained between the barrier and the cable, terminal blocks, or components. The barrier shall extend a sufficient distance beyond the outer edge of the separation group cable or cable bundle such as to allow a minimum of 6-inches air space between cables or redundant separation group. (See Figure 19b.)

c. (Deleted)

11.2 (Deleted)

11.3 When Non-Class IE cables enter an enclosure with Class IE wiring (field cabling or internal cabinet wiring), a 6-inch minimum physical separation shall be maintained between the Non-Class IE cables and any Class IE wiring. (See Figure 19a.) ~~Where a 6-inch separation cannot be maintained, the Non-Class IE wiring shall be installed in enclosed raceways (rigid steel conduit, flexible conduit, EMT, or enclosed metallic gutter), and a minimum 1-inch separation shall be maintained between the Non-Class IE enclosed raceways and the Class IE cables (See Figure 19c) or installed as described in 11.1b.~~

11.4 (Deleted)

SHEET 4 OF 4
SCN #3119
13-EM-306

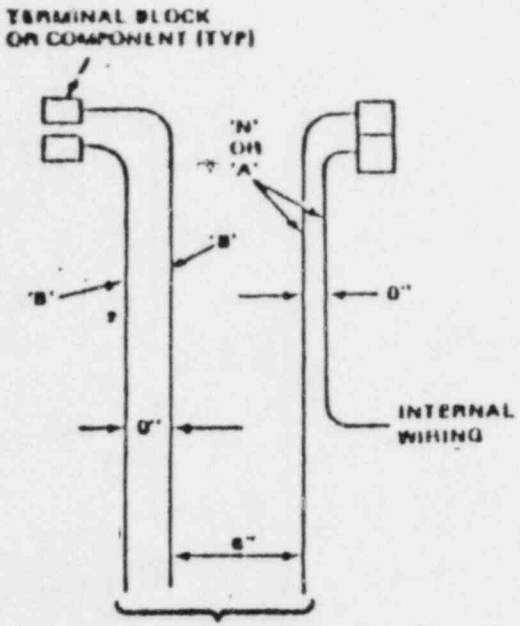


FIGURE 18A

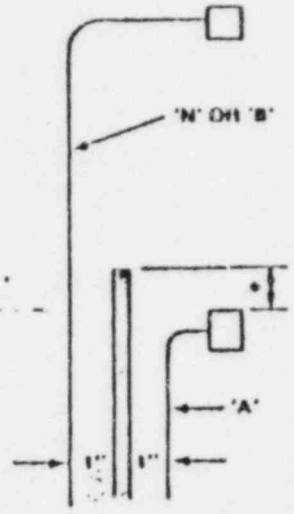


FIGURE 18B

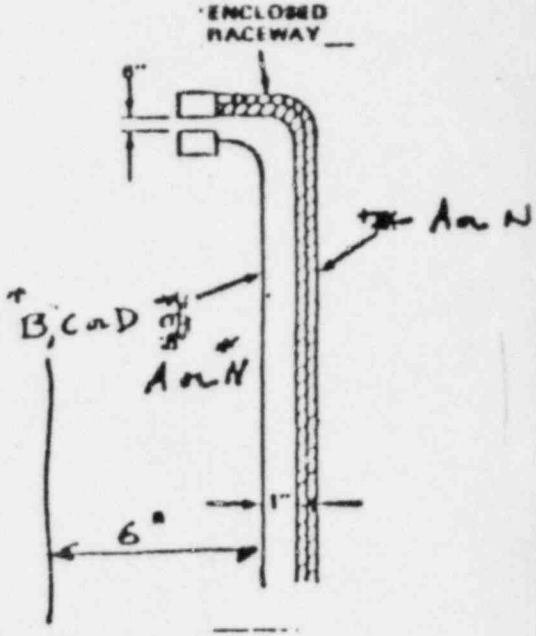


FIGURE 18C

NOTES:
1. ALL DIMENSIONS ARE MINIMUMS.
2. ALTHOUGH THE MINIMUM DIMENSIONS SHOWN ARE ACCEPTABLE, THE MAXIMUM PRACTICAL SEPARATION SHOULD BE GIVEN.
3. 'A' AND 'B' INDICATE CLASS 1E SEPARATION GROUPS. WHILE 'N' INDICATES NON-CLASS 1E CIRCUITS.
- MINIMUM DIMENSION IS THAT DIMENSION REQUIRED TO MAINTAIN 6" SEPARATION. (a + b = MIN 6" AND c + d = MIN 6")
4. 'A', 'B' OR 'N' SEPARATION GROUPS ARE SHOWN TYPICALLY AND ARE INTERCHANGEABLE OR REPLACEABLE BY 'C' OR 'D' SEPARATION GROUPS.

SINGLE BARRIER

PHYSICAL SEPARATION OF CLASS 1E FIELD CABLE CIRCUITS INSIDE CONTROL SWITCHBOARDS, CABINETS, AND PANELS.
FIGURE 18

N When an A or B circuit is separated from
A train by less than 6", with train enclosed
in metallic raceway, then N train must
maintain 6" separation from all other
separation groups within the enclosure

UNITED STATES POST OFFICE

CHANGE OF ADDRESS REQUEST

Date of Request 8 25 82

To be filled out in duplicate
Original - Customer
Duplicate - File

I request the change of address, if one is on file, for:

Name ANTHONY W. LAINE

Last known address 1546 W. PIERSON #69

City PHX State AZ Zip Code 85015

for which I have paid the fee of $ _____ for the search of this information.

Signed: Name OWEN C. SHACKLETON JR.

Address: 1450 Maria Lane, Suite 210

City: Walnut Creek State: Calif

Zip Code 94596

* *

☒ No change of address on file.

Forwarding Address:

Name: _____

Street, P.O. Box or
Route & Box No. _____

City _____ State _____ Zip Code _____

Information supplied by at

Date 8-25-82

CS:ow
2/14/80

Phx MSC C4-1 (Feb 80)

S-19 S-19

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CALIFORNIA 94596

August 25 1982

This is to certify that Owen C Shackleton Jr is an Investigator with the San Francisco Field Office, Office of Investigations, United States Nuclear Regulatory Commission, and that the information he is requesting is to be used in an official investigation being conducted pursuant to the Atomic Energy Act, as amended.

Owen C. Shackleton

Owen C. Shackleton Jr.
Acting Director
Office of Investigations
San Francisco Field Offic

I request the change of address, if one is on file, for:

Name ANTHONY W. LAINE

Last known address 1546 W Pierson St. Apt #69

City Phoenix State AZ Zip Code 85015

Owen C. Shackleton

Investigator
Office of Investigations
San Francisco Field Off

Forwarding Address;

Name: _____

Street, P.O. Box, or Route & Box No. _____

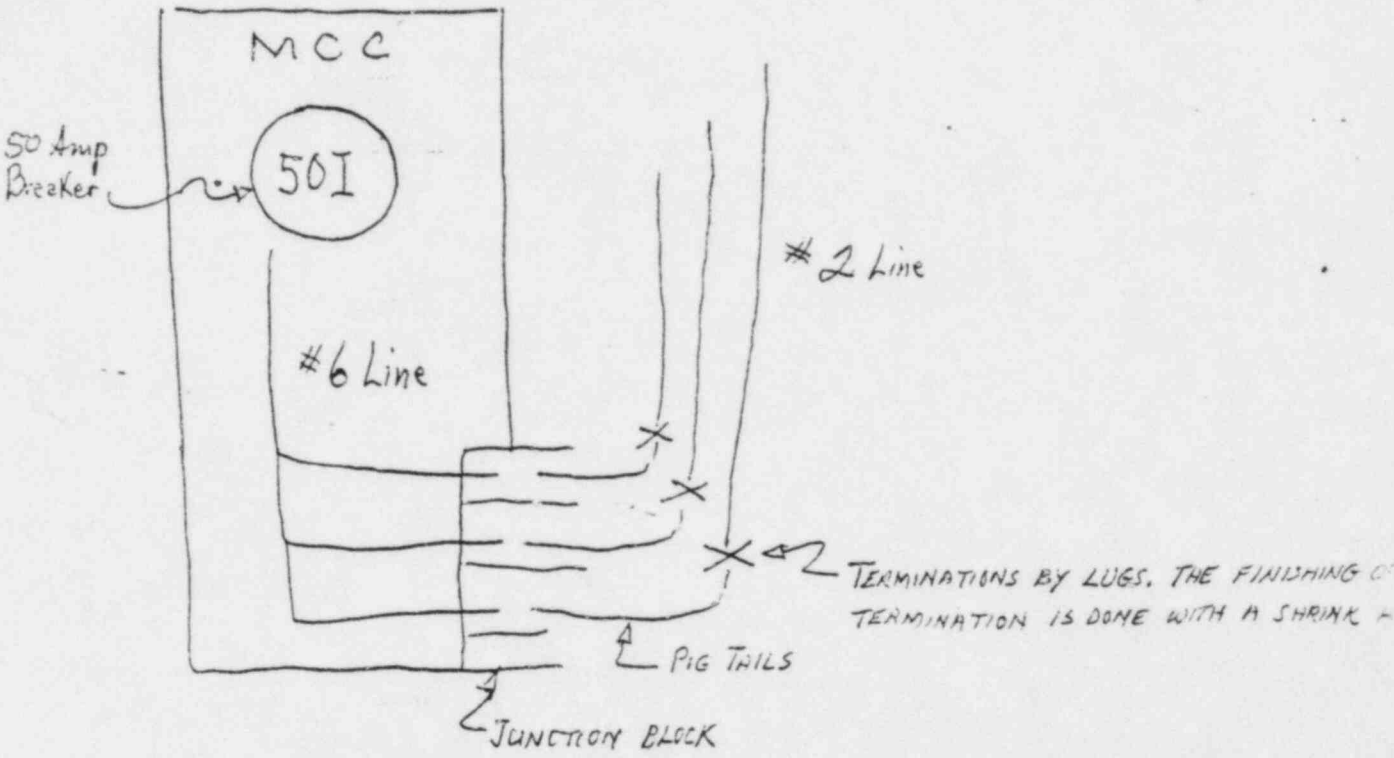
City _____ State _____ Zip Code _____

S-19

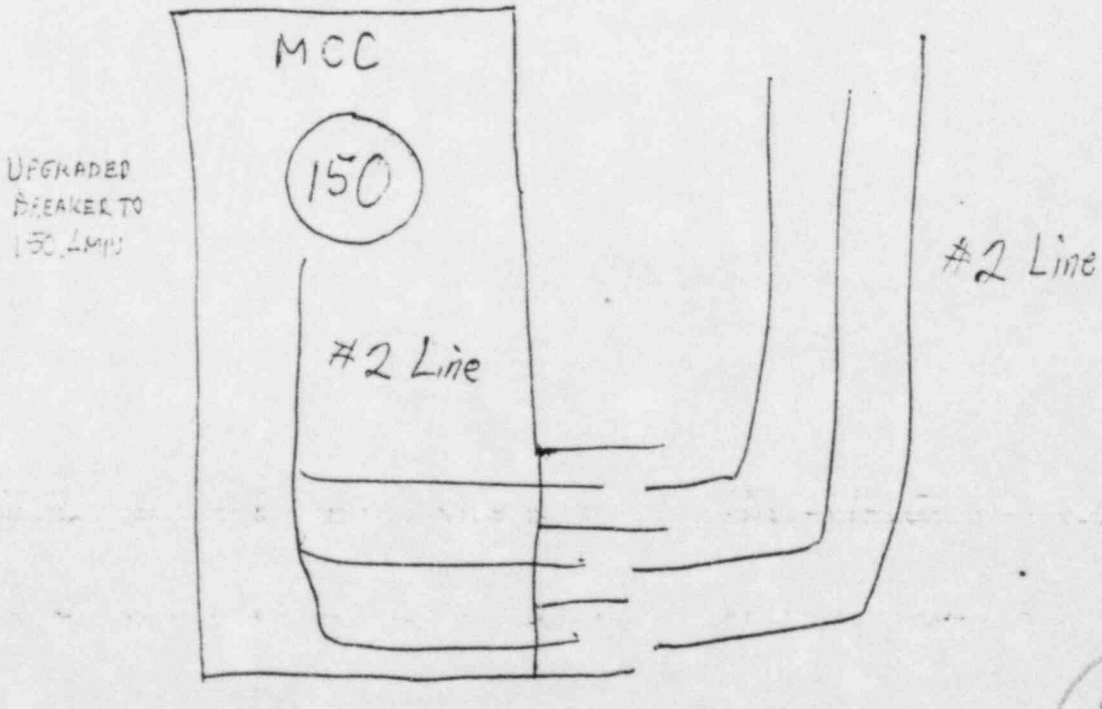
CASE: 5-82-011

8/24/

Original Design (Numbers are only for demonstration purposes)



Modifications That took Place.



S-20

S-

PALO VERDE NUCLEAR GENERATING STATION

UNIT	2 MO DAY YR	3. DRAWING/PART NO.	REV.	4. ITEM DESCRIPTION	5. ITEM LOCATION
1	12 16 81	SEE COLUMN #12	N/A	MAIN CONTROL BOARD	CONTROL BLDG. EL. 140'

6 Q CLASS	7. STARTUP SYSTEM NO.	8. SERIAL NO.	9. SUBCONTRACTOR/SUPPLIER/BECHTEL	10. P.O. OR SPEC NO.	11. ASME AUTHORIZED INSPECTION REQ'D.
Q	RM01 12-16-81	N/A	BECHTEL / COMSIP	13-EM-306 13-JPP-200 R 2-18-82	☐ YES ☒ NO

ITEM	12. DESCRIPTION LIST IN ORDER: NO. PCS., DWG/SPEC REQMT., PRESENT CONDITION	16. FIELD ENGR DECISION	17. ☒ FIELD RECOMMENDED DISPOSITION ☐ ENGINEER DISPOSITION REQ'D. ☐ ENGINEER CONCURRENCE REQ'D.
	SPECIFICATION 13-EM-306, SECTION 11	Rework	Rework. Listed separation criteria problems, items 1 thru 4, and additional similar items discovered during correcting listed items, ~~are to~~ shall be reworked in accordance with each and all of the following: 1. DCP 1SE RM 084 2. 13-EM-306, Rev. 5, SCN 3070 3. FSAR para. 8.3.1.4.1.2, Change No. 1079 Engineering will furnish technical
	REQUIRES A MINIMUM OF 6" SEPERATION		
	BETWEEN CLASS IE CABLES/WIRES. A		
	MINIMUM OF 6" SEPERATION IS REQUIRED		
	BETWEEN NON-CLASS IE AND CLASS IE		
	CABLES/WIRES. WHERE NON-CLASS IE		
	CABLES/WIRES ARE ENCASED IN CONDUITS		
	OR METALLIC GUTTERS A MINIMUM		
	OF 1" SEPERATION IS REQUIRED		
1	1JRMAB02-C:		

15A. REPORTABILITY EVALUATION: NOT REPORTABLE: ☐ OR DER NO. 81-53 ✓

REVIEWERS: R/E [signature] QA [signature] DATE 12/16/81

13. REPORTED BY: VED ARORA

15. INSPECTION/VALIDATION/REVIEW DATE [signature] 12-16-81

19. ACCEPTANCE OF REWORK/REPAIR ☐ QC ENGR _____ DATE ☐ FIELD ENGR AUTHOR. INSP _____ DATE

18. DISPOSITION CONCURRENCE

PROJ FIELD ENGR [signature] 6/21/82 DATE

NUCLEAR GROUP SUPV N/A (IF REQUIRED) DATE

GROUP SUPV V. Arora 6/21/82 DATE

PROJ ENGR [signature] 6/29/82 DATE

AUTHORIZED INSPECTOR N/A DATE

QA ENGR [signature] 7/1/82 DATE

14. ASSUMED CAUSE OF DISCREPANCY

CONSTRUCTION ERROR

INITIATOR J. KADEKIAN DATE 12-16-81

PF-294 (10407)

CONTINUATION SHEET

PALO VERDE NUCLEAR GENERATING STATION — NONCONFORMANCE REPORT NO. E-C 1668 — PAGE 2 OF 3

1. UNIT	2. MO DAY YR	3. DRAWING/PART NO.	REV	4. ITEM DESCRIPTION	5. ITEM LOCATION
1	12 16 81	SEE COLUMN #12	N/A	MAIN CONTROL BOARD	CONTROL BLDG. EL 140'

ITEM	12. DESCRIPTION LIST IN ORDER: NO.PCS., DWG/SPEC REQMT., PRESENT CONDITION	16. FIELD ENGR DECISION	17. ☐ FIELD RECOMMENDED DISPOSITION ☐ ENGR DISPOSITION REQ'D ☐ ENGINEER CONCURRENCE REQUIREMENT
1	RED AND BLACK CODED CABLES (CLASS		direction as requested. WRS 6/18/82.
	1E AND NON-CLASS 1E) ARE TIED IN		
	ONE BUNDLE.		
2	1JRMAB02-E:		
	CABLE # 1ERM42AC1XC (CLASS1E) HAS		
	LIGHTING CONDUIT "T" PRESSING RIGHT		
	UP AGAINST IT.		
3	1JRMAB04-B:		
	CABLES # 1ERM44CC1XA AND # 1ERM44AC1XA		
	ARE TIED TO LIGHTING CONDUIT. BLACK		
	CODED CABLE (NON-CLASS 1E) TO ANNUN-		
	CIATOR IS TIED TO LIGHTING CONDUIT.		
	FLEXIBLE CONDUIT LAYS RIGHT ON TOP OF		
	CLASS 1E CABLE.		
4	1JRMAB05-C		
	CABLES # 1ERM45DC1XA AND 1ERM46-		

(2-4)

PF-7941 (10407) 4/79

PALO VERDE NUCLEAR GENERATING STATION — NONCONFORMANCE REPORT — NO. 1616 9 — PAGE 1 OF 2

TK	1. UNIT	2. MO DAY YR	3. DRAWING/PART NO.	REV	4. ITEM DESCRIPTION	5. ITEM LOCATION
	1	12 16 81	1JRMAB02-E	N/A	MAIN CONTROL BOARD	CONTROL BLDG. EL. 140'

6. Q CLASS	7. STARTUP SYSTEM NO	8. SERIAL NO.	9. SUBCONTRACTOR/SUPPLIER/BECHTEL	10. P.O. OR SPEC NO.	11. ASME AUTHORIZED INSPECTION REQ'D.
Q	RM 01	N/A	COMSIP	13-JM-200	☐ YES ☒ NO

ITEM	12. DESCRIPTION LIST IN ORDER: NO. PCS., DWG/SPEC REQMT., PRESENT CONDITION	16. FIELD ENGR DECISION	17. ☒ FIELD RECOMMENDED DISPOSITION ☐ ENGINEER CONCURRENCE REQ'D. ☐ ENGINEER DISPOSITION REQ'D.
	VENDOR'S SPECIFICATION SECTION 4.0, PAR. 4.7.1 STATES PHYSICAL SEPARATION SHALL BE PROV'DED WITHIN EACH CONTROL BOARD FOR CABLES/WIRES. WHERE SEPERATION IS LESS THAN 6" THE PREFERRED METHOD IS USE OF BARRIERS. RED, GREEN AND YELLOW IS THE CABLE/WIRE CODE FOR CLASS 1E. BLACK AND GREY IS THE COLOR CODE FOR NON-CLASS 1E CABLE/WIRE. VENDOR INSTALLED WIRING HAS NOT	Rework	Rework, Reference Comsip Inc. letter # AR-1299 of March 24, 1982 (attached). Field to provide separation barriers for cable connectors for Foxboro miniature recorders 1J-RJN-UJR-168 & 1J-CDN-PR49/47. ~~Note: the Comsip letter indicates the recorders are identified on NCR E-C-1668 & NCR E-C-1668 is against Spec 13-ES4-306. NCR~~

15A. REPORTABILITY EVALUATION: NOT REPORTABLE: ☐ OR DER NO. 81-53 ✓

REVIEWERS: R/E [signature] QA [signature] DATE 12/16/81

13. REPORTED BY: V. ARORA

15. INSPECTION/VALIDATION/REVIEW DATE [signature] 12/16/81

19. ACCEPTANCE OF REWORK/REPAIR: ☐ QC ENGR _____ DATE _____ ☐ FIELD ENGR AUTHOR. INSP _____ DATE _____

18. DISPOSITION CONCURRENCE

PROJ FIELD ENGR [signature] 12/16/81 DATE

NUCLEAR GROUP SUPV N/A (IF REQUIRED) DATE

GROUP SUPV V. Arora 12/16/82 DATE

PROJ ENGR [signature] 8-10-82 DATE

AUTHORIZED INSPECTOR NA DATE

QA ENGR [signature] 8/13/82 DATE

14. ASSUMED CAUSE OF DISCREPANCY: ~~CONSTRUCTION~~ VENDOR ERROR JK 12-16-81

INITIATOR J. KADEKIAN DATE 12-16-81

PE-794 (10407)

PALO VERDE NUCLEAR GENERATING STATION — NONCONFORMANCE REPORT — NO. E-C 1669 — PAGE 2 OF ~~4~~ 5 (WRS 7/13/82)

1. UNIT	2. MO DAY YR	3. DRAWING/PART NO.	REV	4. ITEM DESCRIPTION	5. ITEM LOCATION
1	12 16 81	1JRMAB02-E	N/A	MAIN CONTROL BOARD	CONTROL BLDG. EL. 140'

ITEM	12. DESCRIPTION LIST IN ORDER: NO.PCS., DWG/SPEC REQMT., PRESENT CONDITION	16. FIELD ENGR DECISION	17. ☐ FIELD RECOMMENDED DISPOSITION ☐ ENGR DISPOSITION REQ'D ☐ ENGINEER CONCURRENCE REQUIREMENT
	COMPLIED WITH THIS REQUIREMENT		~~E-C-1669 is against spec.~~
	THERE ARE RED AND GREEN WIRES		~~13-JM-200. Therefore, the~~
	BUNDLED WITH BLACK WIRES.		~~craft hours accumulated~~
			~~against these Foxboro~~
			~~instruments are to be applied~~
			~~to NCR E-C-1669 and are~~
			~~to be backcharged to Consign.~~
			CBD 7/16/82 WRS 7/13/82

TK

NCR-HC3

PALO VERDE NUCLEAR GENERATING STATION — NONCONFORMANCE REPORT

E-C NO 11676 — PAGE 1 OF 4

1. UNIT	2. MO DAY YR	3. DRAWING/PART NO	REV	4. ITEM DESCRIPTION	5. ITEM LOCATION
2	12 16 81	SEE COLUMN #12	N/A	MAIN CONTROL BOARD	CONTROL BLDG. EL. 140'

6. Q CLASS	7. STARTUP SYSTEM NO	8. SERIAL NO.	9. SUBCONTRACTOR/SUPPLIER/BECHTEL	10. P.S. OR SPEC NO	11. ASME AUTHORIZED INSPECTION REQ'D.
Q	2RM01/PSA01	N/A	BECHTEL/COMSIP	13-EM-306 ~~13-JM-306~~	☐ YES ☒ NO

ITEM	12. DESCRIPTION — LIST IN ORDER: NO PCS., DWG/SPEC REQMT., PRESENT CONDITION	16. FIELD ENGR DECISION	17. ☒ FIELD RECOMMENDED DISPOSITION ☐ ENGINEER DISPOSITION REQ'D. ☐ ENGINEER CONCURRENCE REQ'D
	SPECIFICATION 13-EM-306, SECTION 11	Rework	Rework. Listed separation criteria problems, items 1 thru 12, and additional items discovered during correcting listed items, shall be reworked in accordance with each and all of the following: 1. DCP 2 CE RH 084 2. 13-EM-306, Rev. 5, SCN 3070 3. FSAR para. 8.3.1.4.1.2, Change No. 1079 Engineering will furnish technical
	REQUIRES A MINIMUM OF 6" SEPERATION		
	BETWEEN CLASS IE CABLES/WIRES. A MIN.		
	OF 6" SEPERATION IS REQUIRED BETWEEN		
	NON-CLASS IE AND CLASS IE CABLES/WIRES.		
	WHERE NON-CLASS IE CABLES/WIRES ARE		
	ENCASED IN CONDUITS OR METALLIC GUTTERS		
	A MINIMUM OF 1" SEPERATION IS REQUIRED.		
	CLASS IE CABLES ARE COLOR CODED		
	RED, GREEN, BLUE AND YELLOW. NON-CLASS		
	IE CABLES ARE COLOR CODED BLACK AND GREY.		

12-14-81

1-22-82

13. REPORTED BY: JOHN HECK

15. INSPECTION/VALIDATION/REVIEW DATE: Robert Hegedus 12-19-81

15A. REPORTABILITY EVALUATION: NOT REPORTABLE: ☐ OR DER NO. 81-53 ✓

REVIEWERS: R/E [signature] QA [signature] DATE 12/28/81

19. ACCEPTANCE OF REWORK/REPAIR

☐ QC ENGR _____ DATE _____ AUTHOR INSP _____ DATE _____

☐ FIELD ENGR

14. ASSUMED CAUSE OF DISCREPANCY

CONSTRUCTION ERROR

INITIATOR J. KADEKIAN DATE 12-16-81

18. DISPOSITION CONCURRENCE

mlt

PROJ FIELD ENGR [signature] DATE 6/21/82 — NUCLEAR GROUP SUPV N/A (IF REQUIRED) DATE

GROUP SUPV V. Arlow DATE 6/21/82 — PROJ ENGR [signature] DATE 6/29/82

AUTHORIZED INSPECTOR M DATE — QA ENGR [signature] DATE 7/1/82

RF-794 (10407)

CONTINUATION SHEET

PALO VERDE NUCLEAR GENERATING STATION — NONCONFORMANCE REPORT

E-C NO. 1676 — PAGE 2 OF 4

1. UNIT	2. MO DAY YR	3. DRAWING/PART NO.	REV	4. ITEM DESCRIPTION	5. ITEM LOCATION
2	12 16 81	SEE COLUMN # 12	N/A	MAIN CONTROL BOARD	CONTROL BLDG. EL. 140'

ITEM	12. DESCRIPTION LIST IN ORDER: NO. PCS., DWG/SPEC REQMT., PRESENT CONDITION	16. FIELD ENGR DECISION	17. ☐ FIELD RECOMMENDED DISPOSITION ☐ ENGR DISPOSITION REQ'D ☐ ENGINEER CONCURRENCE REQUIREMENT
1	2JRMNB07-B:		Direction as requested. WRS 6/22/82
	BUNDLED BLACK CABLE LIES RIGHT ON TOP		
	OF GUTTER CONTAINING RED CABLE (VENDOR'S).		
2.	2JRMNB06-E:		
	BUNDLED BLACK CABLE EXITING FROM BLOCK-		
	OUT AT REAR OF CABINET IS ROUTED OVER		
	GREEN CABLE AND ITS BLOCKOUT.		
3	2JRMNB06-B:		
	BLACK CABLE HAS BEEN ~~LAIDED~~ LAID DOWN RIGHT		
	ON TOP OF GUTTER CONTAINING RED CABLE		
4.	2JRMNB05-B:		
	BLUE CABLE ROUTED UNDER GUTTER		
	VARYING CLEARANCES UNDER REQUIRED MIN.		
5	2JRMNB04-C:		
	2 BLACK CABLES ROUTED BUT NOT ENSCONCED		

PF-294.1(10407) 4/79

1. UNIT	2. MO.	DAY	YR	3. DRAWING/PART NO.	REV	4. ITEM DESCRIPTION	5. ITEM LOCATION
2	12	16	81	SEE COLUMN # 12	N/A	MAIN CONTROL BOARD	CONTROL BLDG. EL. 140'

ITEM	12. DESCRIPTION LIST IN ORDER: NO. PCS., DWG/SPEC REQMT., PRESENT CONDITION	16. FIELD ENGR DECISION	17. ☐ FIELD RECOMMENDED DISPOSITION ☐ ENGR DISPOSITION REQ'D ☐ ENGINEER CONCURRENCE REQUIREMENT
	TO CABINET.		
6	2JRMNB07-C:		
	BUNDLED BLACK CABLES PASS UNDER		
	GUTTER WITH NO CLEARANCE.		
7	2JRMNB02-D:		
	BLUE CABLES ROUTED OVER GUTTER		
	WITH NO CLEARANCE BETWEEN THE TWO.		
8	2JRMNB03-B:		
	BLACK CABLE ROUTED UNDERNEATH		
	GUTTER (CONTAINING RED CABLE) WITH		
	NO CLEARANCE BETWEEN THE TWO.		
9	2JRMNB03-C:		
	BLACK CABLE ROUTED NEXT TO GUTTER		
	(CONTAINING RED CABLE) WITH NO		
	CLEARANCE BETWEEN THE TWO.		

PALO VERDE NUCLEAR GENERATING STATION — NONCONFORMANCE REPORT

NO E-C-1676 PAGE 4 OF 4

1. UNIT	2. MO DAY YR	3. DRAWING/PART NO. *	REV	4. ITEM DESCRIPTION	5. ITEM LOCATION
2	12 17 81	SEE COLUMN #12	N/A	MAIN CONTROL BOARD	CONTROL BLDG. EL. 100'.

ITEM	12. DESCRIPTION LIST IN ORDER: NO. PCS., DWG/SPEC REQMT., PRESENT CONDITION	16. FIELD ENGR DECISION	17. ☐ FIELD RECOMMENDED DISPOSITION ☐ ENGR DISPOSITION REQ'D ☐ ENGINEER CONCURRENCE REQUIREMENT
10	2JSACC04:		
	BLACK CABLE ENTERING CABINET AT TOP		
	CROSSES YELLOW CABLE WITH NO CLEARANCE.		
11	2JSABC04:		
	BLACK CABLES ENTERING BOTTOM OF CABI-		
	NET CROSS-OVER YELLOW CABLES WITH		
	NO CLEARANCE.		
12	2JSADC04:		
	BLACK CABLES ENTERING BOTTOM OF		
	CABINET ROUTED BY BLUE CABLE WITH		
	NO CLEARANCE.		

1. UNIT	2. MO DAY YR	3. DRAWING/PART NO.	REV	4. ITEM DESCRIPTION	5. ITEM LOCATION
1	12 16 81	SEE COLUMN #12	N/A	MAIN CONTROL BOARD	CONTROL BLDG. EL. 160'

ITEM	12. DESCRIPTION LIST IN ORDER: NO. PCS., DWG/SPEC REQMT., PRESENT CONDITION	16. FIELD ENGR DECISION	17. ☐ FIELD RECOMMENDED DISPOSITION ☐ ENGR DISPOSITION REQ'D ☐ ENGINEER CONCURRENCE REQUIREMENT
4	DC IXA ARE TIED DOWN TO LIGHTING		
	CONDUIT		

PF 794.1(1040?) 4/79

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V
1450 MARIA LANE, SUITE 210
WALNUT CREEK, CALIFORNIA 94596

Q5-82-003

MAR 23 1983

Marion — Pls. make a copy for closed case involving alleger — ROYCE on Palo Verde.. File this copy in 5-82-009 Area

NOTE TO: Those on Distribution Below

FROM: P. Narbut

SUBJECT: RESPONSIBILITY FOR PALO VERDE AFFIDAVITS

An informal meeting was held 3/23/83 regarding unreviewed affidavits from GAP. Attendees were Sternberg, Young, Narbut, Fiorelli and Vorderbrueggen. A subsequent informal discussion was held between O. Shackleton and P. Narbut.

The results of the meetings were as follows:

- The GAP affidavits from Royce and Gunderson were addressed to OI (Fortuna) and have not been assigned to Region V.
- Shackleton has analyzed the Gunderson affidavit and will identify any new areas to Region V shortly.
- Shackleton will probably pass the entire Royce affidavit to Region V shortly to be reviewed.
- Fiorelli will review the Royce affidavit (now) for any items not already covered in his original inspection of the allegations and Region V will assign action if and when the affidavit is passed to Region V for action.

P. P. Narbut

Distribution: D. M. Sternberg
T. Young
G. Fiorelli
L. E. Vorderbrueggen
O. C. Shackleton
J. H. Eckhardt

~~8310240295~~

S-12