

From: (b)(7)(C)
To: <R4allege@NRC.gov>
Date: Fri, Jun 23, 2006 12:31 AM
Subject: ALLEGATION NO. RIV-2006-A-00454

June 22, 2006
Harry,

Outside of
Scope

Today, I received your letter regarding the process. Thank you very much. soon, I will decide about the [] and inform you of my decision.

Please pass on the following information to George.

Per our telephone conversation, below I have provided information related to Concern 1.

- Calculation Procedure: SO123-XXIV-7.15 Rev. 66 pages, see attached pages 22 & 31
(See attached file: Calc Procedure Page33.pdf)
- Maintenance Procedure: SO23-I-2.58-1 Rev. 0 pages 52, see attached page 37 specifies the tolerance as + or - 15%
(See attached file: MaintProcedurePage37.pdf)
- Summary of Problems with 480V Load Center Protection (for Cables and Motor)
References: 480V Power Circuit Breaker: Calculation: E4C-099 and 600V Power Cable Ampacity for 480V Load Center W/ Maintained Spacing

The LTPU settings do not protect several cables. The setting does meet the acceptance criteria. See Excel file table 1.
The settings for motor feeder breakers do not meet the acceptance criteria. See Excel file table 2.
The for justification for exception does not jive with the reference documents.

The settings for Motor Control Center Feeder Breaker do not meet the acceptance criteria. See Excel file table 3.

(See attached file: 480V Load Center.xls)
Abnormal conditions are neither alarmed nor monitored.
Please call me for detail information and your need for hard copies of reference documents and/or calculation.

I will provide detail information for Concerns 2 & 3 next week

(b)(7)(C)

Information in this record was deleted
in accordance with the Freedom of Information
Act, exemptions
FOIA - []

E/6

R4ALLEGE - Charging Pump P190

From: (b)(7)(C)
To: <R4allege@NRC.gov>
Date: 7/5/2006 1:28 AM
Subject: Charging Pump P190
CC: (b)(7)(C)

7.C

7C

Harry,

Please forward this e-mail to George

George, John

It was a very useful meeting.

I have attached a typical excel file. I developed this file for the OA in 2001.

Please note there are two issues: cable damage and cable life.

The purpose of the trip setting, LTPU, at 180A, is to keep the motor running for continuity of generation until the over load reaches 180A. The chart clearly indicates that the conductor temperature will rise above the emergency rating and the conductor rating of 250°C. The later indicates that conductor will damage before the breaker trips the load. And the load may not operate during a design basis event.

If the over load is around 129A then the conductor temperature will reach emergency rating. Since there is no alarm, one can not guess how many times the conductor has reached at or beyond the emergency rating. In other words it can not be determined the degraded condition and/or the remaining life of the cable.

I will talk to EQ engineer tomorrow about the cable life.

At present I am revising the E4C-051 calculation. I have revealed several flaws in the calculation. One of them may reduce the cable ampacity of the charging pump from 101A to 86A. I would like to discuss this issue with you.

Please call me at your convenience. Or send me e-mail at my home or work

Thanks

(b)(7)(C)

7C

From: (b)(7)(C) 7c
To: <R4allege@NRC.gov>
Date: Thu, Jul 13, 2006 9:05 AM
Subject: Fw: RIV-2006-A-0054

Harry,

Please forward this e-mail to George

George,

The power cables for the charging pumps are tagged as Appendix R cables. These pumps are required for safe shutdown. The concern is that the cable may have failed and it will not perform it's function during safe shutdown. The analysis for the Appendix R compliance are stated in calculation E4C-110. I have not reviewed this calculation in detail and I do not have thorough knowledge for Appendix R. However, you may find that present setting of charging pump is not adequate. It appears that the attached is a typical time current curve.

Please call me if you have any question and/or need information at work

(b)(7)(C)



7.C

Harry,

Please forward this e-mail to George

George,

Attached is an extract of one subsection of EQ document M38773, related to Cable Aging (life).

(See attached file: CableAgingM38773.pdf)

Also, based on this document, I have calculated cable aging for two abnormal load values. The current and conductor temperature data is taken from the excel file for charging pump 3P190, which I sent to you on July 4, 2007. The high LTPU will allow abnormal current flow through cable in the range of 153A to 207A. As a result, either the cable will fail or reduce the cable life significantly. That is the safety concern.

(See attached file: cablelife3.xls)

I would like to discuss the above items plus the cable ampacity calculations with you. I will be available at any time next week.

Thanks

(b)(7)(C)



7.C

From: (b)(7)(C)
To: <R4allege@NRC.gov>
Date: Thu, Jul 13, 2006 2:34 PM
Subject: RV

Harry,

Please pass this e-mail to George.

George,

I believe, we have stretched the ICEA standard for 600V cables. Recently, during preparation of next revision of calculation E4C-051, I revealed that the cable ampacities tabulated in ICEA standard P46-426 are for 1KV, 8KV, and 15KV cables. Per this standard, the cable ampacities for a given size cable is lower at lower voltage. One of the factor for reduction in ampacity is the cable diameter. The cable diameter of 600V cable is smaller than that of diameter of 1KV cable stated in ICEA standard. Based on this, we have not used the correct ampacity values for the 600V power cables routed in the raceways without barriers.

Also, the ICEA standard P46-426 was superseded in 1994 by IEEE 835. The ampacities in this standard for conduits are lower than ICEA values. Our base line test values are closer to IEEE 835 for both trays and conduits without any barrier.

The above is for your information.

(b)(7)(C)

From: (b)(7)(C)
To: "R4ALLEGE R4ALLEGE" <R4ALLEGE@nrc.gov>
Date: Mon, Jul 24, 2006 3:50 PM
Subject: Fw: E418 Control Room emergency Fan

Harry,

George and John both helped me very well. I appreciate their sincere interest and hard work in understanding and assertive approach in presenting the problems to SCE.

George,

The calculated cable life of power cables for Emergency Cooling fan for abnormal currents are as follows:

Abnormal Current	Conductor temperature	Life
Equal to trip Setting*1.1= 275A	229°C	2.4 Hours
Equal to trip Setting= 250A	178°C	3.5 Days
Equal to FLA*1.4= 238A	169°C	15 Days
Equal to FLA *1.3= 221A	138°C	108 Days
Equal to FLA*1.17= 200A	116°C	981 Day

The above data indicates the cable life reductions rapid under abnormal condition. In other words if abnormal current, 238A is for day or 2 days will reduce the life significantly.

I would recommend to enforce item 2 regarding FSAR, Otherwise, the management will not consider that the derated cable ampacity can be a weak link during accident and the consequences.

(b)(7)(C)

E418 Control Room emergency Fan

Harry,

Please forward this e-mail to George or John. Please contact one of them and tell them to contact me at (b)(7)(C) if they can. 7C

1. Attached is temperature profile of the subject fan during abnormal condition. I will calculate the life of cable at this temperature. Abnormal load is due to mechanical condition, bearing, damper position, etc
2. I believe the original design as committed in FSAR per IPCEA standard was correct for the existing setting. However, it appears that they did not change the cable ampacity base for raceways with separation and fire barrier. I am not sure that there was a 50.59 screening for this significant design change.
3. Bottom line, cable is the weak link. If one is comparing this with MOV then the difference is the cable. In case of MOV the cable can carry the current safely. However, that would not be the case for non-mov load.
4. If the load is required to carry abnormal load during accident condition, then improve cable ampacity.

(b)(7)(C)



7C

From: (b)(7)(C)
To: <JPR2@NRC.gov>
Date: 7/27/2006 11:04:10 AM
Subject: 600V Cable test repot and AR

John,

Attached PDF file is for subject report and AR. We has also similar report for 8KV cables.

The cross index of rev. 15 of calculations E4C-051 does not indicate any thing about 10CFR50.59 or FSAR, which indicates that they have violated the requirement that any design change affecting the class 1e components should have been screened or evaluated.

(See attached file: testrepotand AR.pdf)

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