ATTACHMENT E – POTENTIALLY ADVERSE SEISMIC CONDITIONS

ATTACHMENT E – POTENTIALLY ADVERSE SEISMIC CONDITIONS

LB#	SWC/AWC #	IDENTIFIED CONDITION	LICENSING BASIS EVALUATION CONCLUSION	RESOLUTION	STATUS
N/A	AWC-007 SWEL1-012 SWEL1-018 SWEL1-019 SWEL1-069 SWEL1-071 SWEL1-073 SWEL1-074	Unrestrained fluorescent bulbs in the area. During a seismic event, the bulbs may become loose and strike nearby equipment.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** This CR describes unsecured fluorescent bulbs on the 15' and 33' of the control building. This is not a seismic good practice and needs to be corrected. However, no equipment is currently being impacted. In the event of a seismic event, if the bulbs fell out, they would break before damaging vital equipment such as static inverters and the 480V switchgear. It would cause a housekeeping concern, but they would not render required safety related SSC's inoperable. Not reportable per SMM-LI-108. **CR Action:** Use tie wrap at each end to restrain the lighting tube.	CR-IP3-2012-03123 CLOSED
N/A	AWC-003	The nitrogen tank at IA-PCV-817 is adequately supported at the wall. However, the steel cap for the tank is loose on a wall channel behind the tank and could be displaced by a seismic event and strike nearby equipment.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Action:** Either remove the cap or tie down the cap.	CR-IP3-2012-03128 CLOSED
N/A	AWC-003	Unistrut on masonry block wall 53B is missing an anchor. The base of the Unistrut is supported with duct tape and the Unistrut now has approximately 4 feet of unsupported cantilever.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** The Unistrut supports tubing associated with the CCR A/C system. The Unistrut channel was evaluated and the seismic displacement is less than 1/16". Since the displacement and stress are very small, there is no adverse seismic interaction. CCR A/C remains operable. Not reportable per SMM-LI-108. **CR Action:** Remove the duct tape and no other action is needed. WO 00332487.	CR-IP3-2012-03129 CLOSED

ATTACHMENT E – POTENTIALLY ADVERSE SEISMIC CONDITIONS

LB #	SWC/AWC #	IDENTIFIED CONDITION	LICENSING BASIS EVALUATION CONCLUSION	RESOLUTION	STATUS
N/A	AWC-010	• Panel (PID 08219) adjacent to the door: Unistrut legs corroded and broken at the base. The toe plate at the floor penetration between the Unistrut legs is loose and is not protecting the opening. • Service Water Pumps Annubars has rotted out at the base. The panel lacks of lateral restraints and is free to displace laterally. • Piping grout penetration protection was found cracked and chipped at various locations allowing water seepage. • Floor grating behind the electrical panels is not fixed to the structural steel and could displace laterally. In addition, this grating also serves as a support for conduits at the level below. Displacement of the grating would affect the support for the conduits. • Observed a loose scaffold pole (on the floor) beneath a wall beam. During a seismic event the pole may act as a missile and strike nearby equipment. • Electric Heat Trace Cabinet 31 has abraded cables at the top of the cabinet. The back of the cabinet is mildly corroded at the back/bottom. A box of bulbs is loose on the inside of the cabinet. An unsecured tag is on a shelf in the cabinet. A brown spot on the back of the cabinet may be the result of a burning effect due to high temperature. Electrical needs to investigate.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** Components in the Service Water Pump enclosure support Operability of Service Water per TS 3.7.9. Per Engineering Input: 1. The sheet metal cabinet is a relatively soft compared to the Service Water Pumps, and will not damage the service water pumps during a seismic event. 2. The SW annubar cabinet is a relatively soft compared to the Service Water Pumps, and will not damage the service water pumps during a seismic event. 3. Electric heat trace cabinet 31 has steel angle clips that will hold the cabinet in place during a seismic event. 4. The floor grating will not lift up during a seismic event, and will not fall down on the Zurn Strainers or panels. Inside the EHT Panel: 1. The abraded cable is functioning properly and the abrading condition is no longer present. The inner braided sheath is showing through the exterior, but no energized components are exposed. 2. The contact for the Zurn Pit heat trace is functioning properly at this time, and is not evidencing any performance degradation. The water proofing grout is cracked as described. Any leakage through this connection will drain to the SW Bay and will not flood any required SSC-related equipment. The connections from the power feed and through the floor pad are currently functioning as designed with no issues, and are above the FSAR assumed flooding level of 15'. **CR Action:** Notify FSS created WR 287292, 287293 & 287296 1. The cabinet (PID 8219) support needs to be repaired. 2. Implement the EC to repair the anchorage for SW annubar cabinet. 3. Clip the grating panels and hook the grating to the support beam. 4. Remove the loose items for house keeping. 5. Remove old cracked and broken grout. Put a coating on the power feed and conduits and seal the penetration. Replace old, cracked grout with new ones is also an alternative.	CR-IP3-2012-03166 CLOSED

ATTACHMENT E – POTENTIALLY ADVERSE SEISMIC CONDITIONS

LB#	SWC/AWC #	IDENTIFIED CONDITION	LICENSING BASIS EVALUATION CONCLUSION	RESOLUTION	STATUS
N/A	AWC-011	• Observed a loose chain and a Unistrut on top of the RWST-31 foundation. • Observed a rock resting on the RWST-31 stiffener ring. • Multiple piping insulation connections have been dislodged and held together by tape.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** This issue is a housekeeping concern and as such does not require a detailed operability determination. The items of concern do not pose any type of fire loading concern, and do not prevent access to the RWST. The items of concern are all made of metal or stone. The insulation straps were left over from previous work; all insulation is intact. Operations performed a walkdown / clean-up of the area and all objects described have been removed. This condition does not meet the reportability requirements of SMM-LI-108. **CR Action:** WRN 290099 & WRN 289342 Remove the steel chain, channel and rock immediately. Repair or provide strap at the loose insulation.	CR-IP3-2012-03213 CLOSED
N/A	SWEL1-018 SWEL1-019	The bolt pattern per drawing 9321-F-65013 is 10" x 10". The field measured bolt pattern is 8" x 10" on two base plates. No bolt placement tolerance is indicated on the drawing.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** ITS 3.8.7 requires the 2 SOLA Transformers that supply 34 Inst busses. 32 Inst Bus requires 32 Inverter only and does not address 32 BU SOLA Transformer. However 32 BU SOLA transformer is FSAR equipment defined in Chapter 8 - Electrical Systems. Its function is to back up the normal power supply to the 32 Instrument Busses. As mentioned in the CR the calculation 6604.221-CB-TS-001 has been revised to show that the as-found anchorage is acceptable. The SOLA Transformer remains functional at this time. This does not meet the reportability requirements of IP-SMM-LI-108. **CR Action:** Update the drawing to show the as-built configuration.	CR-IP3-2012-03229
N/A	SWEL1-023	• Fluorescent bulb adjacent to 32 ABFP needs to be wire restrained to light fixture. • Observed tubing coming out of BFD-61-3 that is in contact with a U-Bolt that supports valve BFD-31.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** 32 ABFP Is currently INOPERABLE for maintenance activities. This condition would not have rendered 32 ABFP INOPERABLE. There is no IP-SMM-LI-108 immediate reportability associated with this condition. **CR Action:** WRN 289143, 291323 (1) The tubing coming out of BFD-61-3 to be re-routed to provide a 1" clearance from the U-bolt. WR initiated for this work. (2) The fluorescent light bulb must be wrapped around tight. WR initiated for this work.	CR-IP3-2012-03246 CLOSED

ATTACHMENT E – POTENTIALLY ADVERSE SEISMIC CONDITIONS

LB #	SWC/AWC #	IDENTIFIED CONDITION	LICENSING BASIS EVALUATION CONCLUSION	RESOLUTION	STATUS
N/A	AWC-007	Cable tray 34K support against the north wall is missing a Unistrut bolt. The support has 3 bolt holes with only two bolts in place.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** As mentioned in the body of the CR, in the CB EL. 15', a Unistrut channel support for cable tray 34K has a connection flat plate (P1031) that is missing one bolt. The connection plates in the vicinity all have a bolt at the middle hole, but this one does not. The tray has only 2 small cables on it. The estimated weight of the supported tray span is 200#, and the existing 2 bolts have a minimum capacity of 2000#. The existing condition is structurally adequate and acceptable as is. Therefore it remains operable. This is not reportable per IP-SMM-LI-108 **CR Action:** No further action is needed. The existing condition is structurally acceptable.	CR-IP3-2012-03281 CLOSED
N/A	AWC-019	Observed a not tightly secured metal wire trough located on the east wall (above the speaker). The wire trough is attached two Unistruts channels with one Unistrut bolt on each channel at the top. There is an approximately ¾" to 1" gap between the wire trough and the Unistrut. The wire trough seems to be light in weigh; however, during a seismic event the trough may dislodge and strike nearby equipment. The wire trough should be properly secured to prevent any adverse seismic conditions.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** Following discussion with engineering it was determined that the bolt in question, although not fully engaged, is sufficient to hold the associated cables due to their light weight and other supports in the area. Additionally, EN-OP-104 attachment 9.1 item 43 states that a missing fastener on a cable tray is not an operability concern provided there are no more than two missing or loose fasteners and no FME concern exists. There were no additional fasteners identified as loose or missing and no FME concern due to this issue. The associated cables supported by this bracket therefore remain operable. This condition is not reportable per IP-SMM-LI-108. **CR Action:** WR 288466 was created to tighten the bolts behind the wire trough.	CR-IP3-2012-03363 CLOSED
N/A	SWEL1-035	• The support has a horizontal tube at the base whereas the design drawing 9321-L-60825, Sheet 26 shows the vertical steel continuing to the base plate. • The vertical post is not concentric with the base plate as detailed on the design drawing 9321-L-60825, Sheet 26. • The post is a tube steel section whereas the design drawing 9321-L-60825, Sheet 26, shows a channel	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** MS-PCV-1310A and 1310B are steam supply valves to 32 AFW pump and are designed to shut on high temperature in the AFW pump room to protect the operability of 31 and 33 AFW pumps in the event of a steam break. As stated in the body of the CR, although the drawings in Merlin do not reflect the actual plant configuration, the actual plant configuration was evaluated in ECN-02-3-023-001 and IP3-CALC-MS-03726. Additionally, due to the current configuration of the support for MS-H-1027-18-V, the spring support will only see a vertical downward force and will therefore not cause tension or a shear force acting on the anchor bolts. The 4" distance will have no adverse effect, and is structurally acceptable. The operability of 1310A and 1310B are verified by performance of 3-PT-Q101 which was last completed on 9/19/12 under WO 52424550. The AFW system remains operable. This condition is not reportable per IP-SMM-LI-108. **CR Action:** Configuration Management group should retrieve the original installation drawing from the ECN and project file, and update the current drawing because MERLIN does not have an image file of the as installed support.	CR-IP3-2012-03394

ATTACHMENT E – POTENTIALLY ADVERSE SEISMIC CONDITIONS

LB#	SWC/AWC #	IDENTIFIED CONDITION	LICENSING BASIS EVALUATION CONCLUSION	RESOLUTION	STATUS
N/A	AWC-015	During a seismic event, the following observations have potential to act as a missile and strike nearby sensitive equipment: • Rack adjacent to Instrument Bus 31 has an unrestrained laptop and printer. • Boxes against the west wall on the floor. • A box resting on top of a cabinet at the northwest corner of the room. • Three unrestrained binders on top of Hydrogen Recombiner No. 31 Control Panel. • Unrestrained phones, printers and monitors at the work stations. • Unsecured speaker on top of 34 Control Room Supplemental Cooler along the south wall.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** This condition is not reportable per EN-LI-108. Condition is operable; items of concern are considered medium or light weight equipment and meet the requirements of IP-SMM-DC-910. **CR Action:** Created WR 00288705 to install a vertical barrier on top of the work station, between the equipment and the control work station to prevent loose objects from travelling toward the equipment in a seismic event.	CR-IP3-2012-03398
N/A	AWC-012 AWC-014 AWC-016 AWC-017	• Fluorescent light bulbs in the area need to be secured to the light fixtures. • The AWC-012 area has a bucket on the floor which is not restrained and a tool box which is not secured.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** This CR describes unsecured fluorescent bulbs on various elevations of the Aux boiler feed pump building. This is not a seismic good practice and needs to be corrected. However, no equipment is currently being impacted. In the event of a seismic event, if the bulbs fell out, they would break before damaging vital equipment in the area. It would cause a housekeeping concern, but they would not render required safety related SSC's inoperable. The unsecured tool box and bucket are already on the floor and would not impact any important components on the aux feed pumps. Not reportable per SMM-LI-108. **CR Action:** WR 289193 generated for restraining the fluorescent light bulbs	CR-IP3-2012-03462 CLOSED
N/A	AWC-017 AWC-016	• AWC -017: Floor grating is not attached to the steel support beams. Most grating is restrained laterally by the pipe supports and the wall on the opposite side. However some panels are only restrained by the wall and could displace laterally under seismic action. Adjacent panels cannot restrain the loose panels because the toe board is not continuous but is attached to each individual panel. They could then impact the main steam lines. • AWC-016: Some sections of grating are not attached to the steel beam below.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** This CR describes multiple cases of floor grating that is not secured properly with grating clips. As described in the CR and per discussion with engineering there is no operability concern. The interaction between the grating and the required valves would be insignificant if the grating was to be moved by a seismic event. As mentioned in the CR the sections of grating are equivalent to 1 foot of piping which is not significant enough to render damage to the valves that would cause them to be inoperable. As stated, MS-45-6 and MS-1-31 remain operable at this time. This is not reportable per IP-SMM-LI-108. **CR Action:** WR 289232 is generated.	CR-IP3-2012-03473

ATTACHMENT E – POTENTIALLY ADVERSE SEISMIC CONDITIONS

LB #	SWC/AWC #	IDENTIFIED CONDITION	LICENSING BASIS EVALUATION CONCLUSION	RESOLUTION	STATUS
N/A	AWC-025 AWC-022 SWEL1-009 SWEL1-011 SWEL1-025	• Fluorescent tubes need to be restrained for all noted AWC and SWEL1 items except AWC-022. • AWC-022: Observed a broken fluorescent light fixture directly above CS Pump 32. The fixture is tied in the center (with rope or zip tie) but loose at the north end. During a seismic event the fixture may fall and strike the oil reservoir or any sensitive equipment.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** The CR describes a seismic good practice and does not directly impact the equipment in the PAB. The improperly secured bulbs are softer than the equipment they would impact and the bulbs would break before damaging any of the potentially impacted equipment such as the MCC's, charging pumps, Boric Acid transfer pumps, CCW pumps and surge tanks. Equipment in the PAB is operable. Not reportable per SMM-LI-108. **CR Action:** WR 00289354 is generated to restrain the fluorescent light tubes at the locations described above and to replace a slightly damaged light fixture above 32CSP.	CR-IP3-2012-03481 CLOSED
N/A	AWC-042	• Fluorescent light bulbs above the heat Spent Fuel Pit Heat Exchanger are not tied to the fixture. During a seismic event, the bulbs may become loose and strike the heat exchanger gages. • Unrestrained waste bucket on top of a Boric Acid container east of the heat exchanger. • Unrestrained ladders in a ladder rack. • An unrestrained heater with wheels and a power supplier device on a wheeled cart north of the heat exchanger. • Unrestrained cable and tools on top of the operations equipment cabinet at southwest end of the room.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** The housekeeping issues described in this condition report do not affect the functionality of surrounding equipment in the Fuel Storage Building. This condition is not reportable per IP-SMM-LI-108. **CR Action:** WR 289541 generated to restrain the fluorescent light tube to the light fixture, and the housekeeping issues.	CR-IP3-2012-03497

ATTACHMENT E – POTENTIALLY ADVERSE SEISMIC CONDITIONS

LB:#	SWC/AWC #	IDENTIFIED CONDITION	LICENSING BASIS EVALUATION CONCLUSION	RESOLUTION	STATUS
N/A	AWC-040	• Observed two unrestrained ladders on the floor, one by the north wall and the other by the south wall. During a seismic event the ladders may act as missile and strike the fans. • Observed a piping plug that is resting on the floor near the uncover pipe. During a seismic event the plug may act as a missile and strike the Exhaust Fans. In addition, debris may enter the uncovered piping. • Observed an unrestrained broom stick on the north wall. During a seismic event the broom stick may act as a missile and strike the fans. • Observed a wheeled chair in the southeast corner of the room by the door. During a seismic event the chair may dislodge and strike the fans. • Observed bolts and nuts on the electrical box connected to the GAI-Tronics on the east wall by the door.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** The housekeeping issues described in this condition report do not affect the functionality of surrounding equipment in the Electrical Tunnel. This condition is not reportable per IP-SMM-LI-108. **CR Action:** WR 289548 generated for the unrestrained items and housekeeping issues.	CR-IP3-2012-03498
NA	AWC-009	• Control panels TWS#31, #32 and #33 – all nuts on the base plates are heavily corroded with substantial loss of cross section. TWS #34, #35 and #36 are less corroded but also exhibit considerable loss of cross section. • The base plate of Unistrut column supporting conduits has 3 out of 4 anchor bolts missing. The nuts on the opposite base plate are heavily corroded. • SCWP panel base plate has corroded nuts and the panel adjacent to TWS #34 is missing an anchor bolt in its base plate. • The Common Alarm Panel adjacent to the cabinet has padlocks hanging loose on Unistruts. • Leaking pipe near Screen Wash around column line 18 that was covered with a plastic to prevent water from spreading.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** As noted by the originator none of the mentioned items effect safety related systems or seismic structures. They are systems in the CLB and thus must be functional. The missing/corroded bolts do not affect the functionality of the equipment. All equipment mentioned remains in service and thus remains functional. This is not reportable per LI-108. **CR Action:** WR 00290621 is generated to repair/replace the corroded anchorage and missing anchor bolts for item 1, 2 & 3 in the condition description section. WR 00290622 was generated to repair the leaking pipe in item 4.	CR-IP3-2012-03640

ATTACHMENT E – POTENTIALLY ADVERSE SEISMIC CONDITIONS

LB.#	SWC/AWC #	IDENTIFIED CONDITION	LICENSING BASIS EVALUATION CONCLUSION	RESOLUTION	STATUS
N/A	AWC-029 AWC-023 AWC-031 SWEL1-026	• AWC-029: Unsecured cart found in the area. • AWC-029: Loose part found in the area near EBR-22-PAB • AWC-023: Observed tools, cables, parts resting on top of the CCW tank. • AWC-023: Observed two buckets (collecting drips) at 32 CCW pump • AWC-023: Observed a bucket (with wheels) and mop stick near the hot water heater near Sump Pump 37. • AWC-023: Observed hoses coming out of CCW tank that are laid over piping, piping supports and ducts that are not tied down. The ends of two hoses seem to travel to an upper elevation connecting to another CCW tank. Another hose is resting on top of a pipe near SWN-32. • AWC-023: Observed a ladder near the Appendix R safe shutdown ladder that is not restrained. • AWC-031: Observed a brush, tape and a filter resting, unrestrained on a shelf located on the south wall of the room between SI Pumps 31 and 32. During a seismic event these items may dislodge or act as missile and strike nearby components. • SWEL1-026: Loose parts in the area need to be removed.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** The housekeeping issues described in this condition report do not affect the operability or functionality of surrounding equipment in the PAB. This condition is not reportable per IP-SMM-LI-108. **CR Action:** WR 00289563 is generated for general housekeeping items. WR 00289564 is generated to restrain various items for good seismic housekeeping practice.	CR-IP3-2012-03501
N/A	AWC-025	There is a hot water heater adjacent to the concrete column near Boric Acid Tank 31 which does not have any apparent anchorage.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** This condition does not meet the reporting criteria of SMM-LI-108. The area was evaluated for nearby equipment that may be affected. The Heat Trace Panel, Ducting and the Hot Water tank have no safety related equipment within the height radius of the equipment. Therefore, based on the input from the engineer no operability condition exists. **CR Action:** WR. 00290332 was generated to repair/replace the anchorage of the Electric Heat Tracing support. WR 00290333 was generated to repair the seam joint to provide a permanent fix. WR 00290334 was generated to restrain the heater by means of tying the heater to the column with a steel chain.	CR-IP3-2012-03595

ATTACHMENT E – POTENTIALLY ADVERSE SEISMIC CONDITIONS

LB:#	SWC/AWC -#	IDENTIFIED CONDITION	LICENSING BASIS EVALUATION CONCLUSION	RESOLUTION	STATUS
N/A	AWC-036	Nearby Unistruts for panels and stanchions for pipe supports show varying signs of advanced corrosion.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** The condition described in this CR has been previously evaluated in CR-IP3-2012-00673. From that CR: DP-1113 and 1116 are differential pressure switches for the 33 and 36 Zum strainers respectively. After walkdown Civil Engineering provided the following operability input: "Anchor bolt hex nuts on DP-1116 (SWP36) and DP-1113 (SWP33) have loss of metal resulted from corrosion. At the anchorage of DP-1116 rack, the southwest nut has 50% loss of metal and the southeast nut has 30% loss. At the anchorage of DP-1113 rack, the southwest nut has 5% loss of metal and the southeast nut has 10% loss. Calculation IP-CALC-12-00019 is generated to evaluate the nut/bolt deficiency. The DP-1116 and DP-1113 support is operable with the defective nuts based on the calculation by treating one nut as ineffective to resist tension in a seismic event. All the nuts on these two supports must be replaced at the next scheduled PM time for the piping system and coated to prevent future degradation." The degradation seen on the other pressure switches is not as severe as that seen on DP-1113 and DP-1116, Therefore the service water system remains operable. The second half of the CR describes a condition on the non-seismic portion of the SW pump, since these supports only have to handle dead weight, this part of the system isn't in danger of failing and thus the operability of the Service water system isn't impacted. These events are not reportable per Li-108. **CR Action:** WR 00290612 is generated to replace the anchor bolts and the base plates.	CR-IP3-2012-03633
N/A	SWEL2-001	Fluorscent bulb directly above ACAPPWI that is not secured to the light fixture. During a seismic event the bulb may fall and strike the pump's oil reservoir or nearby equipment.	Condition entered directly into CAP	**Initial Action:** CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** The fluorescent lamp tube may come loose during a seismic event and strike nearby equipment. The fluorescent tube, however, is a soft missile object compared to the plant equipment in the vicinity of the lamp. Nearby equipment- Monitor Tank Pumps, PW Pumps, and RWST Purification pumps are FUNCTIONAL. **CR Action:** WR 00290685 is generated to secure the lighting tube to the fixture.	CR-IP3-2012-03653

ATTACHMENT E – POTENTIALLY ADVERSE SEISMIC CONDITIONS

LB.#	SWC/AWC #	IDENTIFIED CONDITION	LICENSING BASIS EVALUATION CONCLUSION	RESOLUTION	STATUS
N/A	SWEL1-007	• A hood above the cabinet is resting on a water pipe. The original supports are no longer there. At the opposite end, the hood is supported on chains to an upper elevation. SQUG indicated that the hood is adequately supported. It does not appear to be adequately supported at this time. • Piping above and adjacent to the cabinet does not appear to be seismically supported. This includes both water and fire water lines.	Condition entered directly into CAP	**Initial Action**: CR GENERATED - SEE STATUS COLUMN **CR Operability Review:** MCC-34 supports Functionality of various SSC-related equipment. The Cable Tray is currently loaded to half it's capacity (1800 lbs of 3600 lbs capacity), which is sufficient to withstand seismic loads without dislodging the cable tray. The sheet metal hood is estimated to weigh less than 600 lbs, is restrained vertically to the cable tray, and would be supported by the cable tray should it fall onto the cable tray. The piping in the vicinity of the MCC is welded vice screw-type connections, and determined not to be an Operability issue per Engineering. MCC-34 is FUNCTIONAL. **CR Action:** WR 00290777 is generated to support the hood with 4 chains from above. Relocate the breaker that provides safety related function to another MCC, i.e. inside the Control Building, or provide a structure housing for the MCC, protecting it from seismic interaction impact or water spraying onto it.	CR-IP3-2012-03656

ATTACHMENT E – POTENTIALLY ADVERSE SEISMIC CONDITIONS

LB #	SWC/AWC #	IDENTIFIED CONDITION	LICENSING BASIS EVALUATION CONCLUSION	RESOLUTION	STATUS
LB-01	SWEL1-086	A 3/8" tubing inside a Unistrut channel that has a cantilever length of 69". The tubing is coming from PI-1445 in the back of panel AFWP32-LOC-PNL.	Tubing stress caused by the Unistrut channel displacement loading is within the allowable stress limit.	N/A	CR-IP3-2012-03246
LB-02	SWEL1-059 SWEL1-060	The generator base has 3 bolt holes on each side, but there are only 2 bolts with empty hole in the middle. The drawing IP3V-144-5.1-0002 does not show the bolt and spacing information for the connection between the generator and its steel frame. Per walkdown, the bolts are 5/8" diameter and 27.5" spacing for both directions.	The stress interaction for the 5/8" steel bolts between the generator's base and steel frame is less than the acceptable limit.	N/A	
LB-03	SWEL1-072	There is 1" between the Battery Charger 34 and the adjacent P1001 frame. Determine if 1" is adequate for seismic interaction between the two items.	The total seismic displacement of the two items is 0.46", less than 1" provided.	N/A	
LB-04	SWEL1-070	There is a 1" deep, 4"x4" chipped concrete next to a ¾" Hilti Bolt with 3.25" embedment	The Hilti Bolt is evaluated for the 1" deep chipped concrete effect, the bolt still has allowable load factor greater than 1.0.	N/A	CR-IP3-2012-03284
LB-05	AWC-019 AWC-021	The base plate for the pipe support PS-A1-1 & A1-2 has a maximum gap of 3/8" to the concrete. There is additional bending stress at the ¾" Hilti bolt.	The combined normal stress interaction induced by the bending stress resulted from the gap and the tensile stress was evaluated for SSE loading condition and found to be less than 1.0.	N/A	CR-IP3-2012-03361
LB-06	SWEL1-076	1. The jacket water cooler pipe is in contact with the lube oil pipe. 2. Angle iron for support of PI-1561 tubing is in contact with tubing for DF-23-1, PI-1375.	1. There is no adverse seismic interaction. 2. There is no adverse seismic interaction.	1. N/A 2. WR 288457	CR-IP3-2012-03361
LB-07	SWEL1-096	There are two saddles supporting the tank, each with 4 bolts. Two of 4 bolts on the north saddle are missing nuts.	Two bolts without nuts are acceptable. The stress interaction is still less than 1.	WR 288554	CR-IP3-2012-03382
LB-08	SWEL1-076	Observed a tight crack passing through a bolt for a fire protection support at the southeast corner of the room.	The fire protection pipe support is acceptable because the Hilti expansion anchor is based on a safety factor of 4 that accounts for tight crack in concrete.	N/A	
LB-09	AWC-014	2" conduit has an estimated 16 feet span length	Conduit stress is below the allowable limit.	N/A	CR-IP3-2012-03457
LB-10	SWEL1-054	Unistrut channel tube track has 48" cantilever length with a tubing	Stress & deflection of Unistrut is very small. Stress resulted from any seismic interaction will be insignificant.	N/A	CR-IP3-2012-03129
LB-11	SWEL1-095	Determine the seismic interaction between the light pole and the CST	Seismic induced bending moment is less than the design moment of the foundation. Light pole will not impact the CST.	N/A	
LB-12	AWC-028	Camera pole baseplate has no anchor bolt	Camera support cannot overturn, but a higher safety factor is desirable.	WR 290084 is generated to restrain the support to this handrail.	CR-IP3-2012-03565
LB-13	AWC-027	A 4" liquid waste disposal pipe with 25' to 30' span	The stress of the piping system is well within the allowed stress limit per B31.1 code.	N/A	
LB-14	AWC-032	A 1.5" (1.9"OD) hot water pipe has 15' long span	The stress of the piping system is well within the allowed stress limit per B31.1 code.	N/A	

ATTACHMENT E – POTENTIALLY ADVERSE SEISMIC CONDITIONS

LB #	SWC/AWC #	IDENTIFIED CONDITION	LICENSING BASIS EVALUATION CONCLUSION	RESOLUTION	STATUS
LB-15	AWC-033	PVC pipe is supported at 12' span with a zip tie restraint approximately 3 feet from the duct end.	The PCV pipe stress is less than the allowable stress limit.	Install a pipe clamp at the tie wrap location. WR 290228	CR-IP3-2012-03583
LB-16	AWC-002	There is a concrete crack on the wall passing through a conduit support anchor bolt. The support has a ¾" and a 2" conduit on it.	Original expansion anchor design with a safety factor of 4 covers crack width of 10mm to 20mm per EPRI recommendation.	N/A	
LB-17	AWC-012	PWR-599 has 4 anchor bolts instead of 6 bolts	Stress interaction is still less than 1	Update drawing to show 4 bolts pattern	CR-IP3-2012-03580
LB-18	AWC-012	1" FP sprinkler pipe is 1" from the conduit.	Combined seismic displacement is 0.101" < 1" provided.	N/A	
LB-19	AWC-025	Electric heat tracing cabinet base anchorage corrosion	Treating the anchor as ¼", the stress interaction is less than 1.0.	Replace/repair corroded anchorage. WR 290332	CR-IP3-2012-03595
LB-20	SWEL1-045	PAB supply fan's anchor bolts have more than mild corrosion at the wall side.	The corroded expansion anchors are structurally adequate, stress interaction is less than 1 based on SF=4.0	Replace/repair corroded anchorage. WR 290582	CR-IP3-2012-03624

Prepared by: Kai Lo K.C. Date: 11/20/12

Reviewed by: Richard Drake Richard S Drake Date: 11/20/12

Peer Review Team Member

ATTACHMENT F – LICENSING BASIS EVALUATION FORM

ATTACHMENT 9.9 LICENSING BASIS EVALUATION FORMS AND INSTRUCTIONS
Sheet 1 of 3

Licensing Basis (LB) Evaluation Form

086 LO

LB Evaluation No. 12-01 Originating SWC/AWC SWEL-~~023~~

Equipment ID No. 32ABFP Equip. Class 5

Equipment Description 32 Auxiliary Boiler Feed Pump

Location: Bldg. AFPB Floor El. 18'-6 Room, Area Pump room

Condition

During the walkdown, NRC inspector observed a 3/8" tubing inside a Unistrut channel that has a cantilever length of 69". The tubing is coming from PI-1445 in the back of panel AFWP32-LOC-PNL.

Documents Reviewed

No previous seismic calculation for this tubing was found.

Licensing Basis

Tubing providing a safety-related function needs to be supported seismically. The tubing support must be designed seismically. Both the tubing and support stress must be designed to the B31.1 and AISC codes and standards.

Evaluation

The tubing is supported by the Unistrut channel. Since the channel has a long cantilever, the stress, displacement for the channel, and the channel induced displacement load onto the tubing need to be evaluated.
A new evaluation is performed on the next page.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 10-17-2012
Licensing Basis Reviewer

Reviewed by: Richard Drake Date 10/17/12
Peer Reviewer

SWEL1 - ~~023~~ 086 KL

L = cantilever length of Unistrut channel =	69	in		
w = uniform weight of Unistrut channel =	1.9	plf =	0.1583	#/in
Use w =	0.18	#/in	, cons. to include weight of tube	
S = min. section modulus =	0.203	in^3		
I = min. moment of inertia =	0.186	in^4		
E = modulus of elasticity =	2.90E+07	psi		

At AFB building EL. 18'-6, use shield wall 0.5% damping response spectrum

Gh = peak horizontal acceleration =	0.64			
Gv =(2/3)Gh =	0.427			
Gr = resultant of acceleration = $[2Gh^2 + (1+Gv)^2]^{0.5}$ =	1.69			
MRM = multi-modal response multiplier =	1.50			
M = bending moment = $wL^2/2$ =	428.5	in-lb		
fb = bending stress = MRM(Gr)(M/S) =	5349	psi < 1.33(25000) =	33250	psi, o.k.
Check deflection				
d = deflection = MRM(Gr)[$wL^4/(8EI)$] =	0.240	inch		
S_t = section modulus of tubing =	0.00423	in^3	TUBING = 0.065 SCH.	
I_t = moment of inertia of tubing = S_c(0.5x0.375) =	0.0007931	in^4		

For a simple support beam with force at mid-span, length = 60 in

$M = 12EI_td/L^2$

$fb = M/S_t = 12EI_td/(S_tL^2)$ =	4343	psi << 1.8(15000psi) = 27000psi	

Since the seismic displacement is small, any tubing stress resulted from the 0.24" forced displacement loading on a flexible tubing system will not be significant.

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-02 Originating SWC/AWC SWEL-059 & 060

Equipment ID No. 31MGS-COUP, 32MGS-COUP Equip. Class 13

Equipment Description 31 & 32 Rod Control Motor Generator Set (31 & 32 MG Set)

Location: Bldg. CB Floor El. 33'-0 Room, Area _____

Condition

The generator base has 3 bolt holes on each side, but there are only 2 bolts with empty hole in the middle. The drawing IP3V-144-5.1-0002 does not show the bolt and spacing information for the connection between the generator and its steel frame. Per walkdown, the bolts are 5/8" diameter and 27.5" spacing for both directions.

Documents Reviewed

No previous seismic calculation for this connection bolting was found. No SQUG calculation.

Licensing Basis

Equipment providing a safety-related function needs to be supported seismically to be functional and II over I seismic interaction.

Evaluation

A new evaluation is performed on the next page. The evaluation is for the 5/8" bolts between the generator's base and the steel frame.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 10-17-2012
Licensing Basis Reviewer

Reviewed by: Joseph Ruch Date 10/17/2012
Peer Reviewer

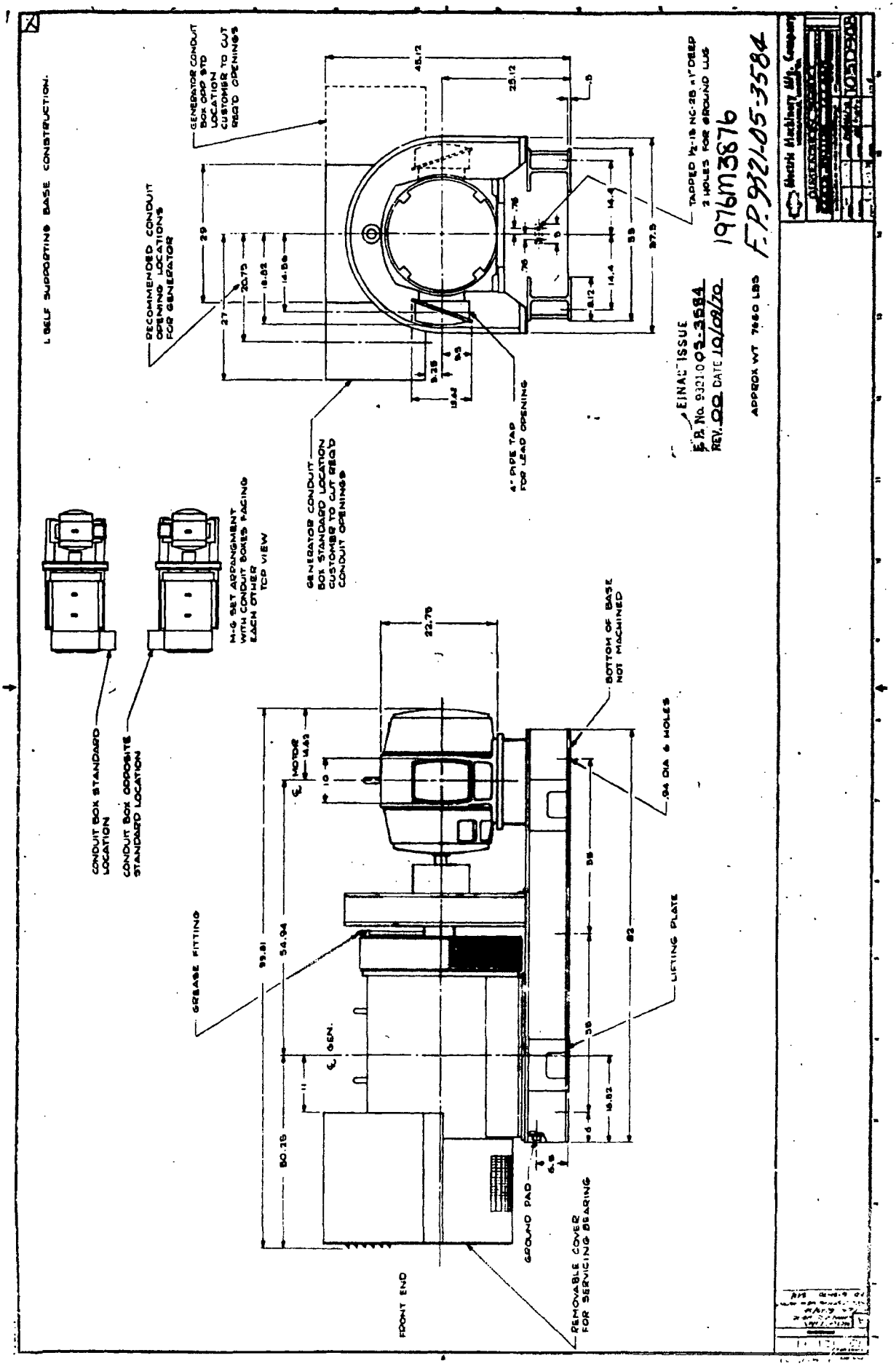
SHEET 2 OF 3

SWEL NO. 59 & 60

Check bolt between generator and frame, 4 bolt spaced at 27.5" both way.

Building : CB EL. 33'		
Gh = horizontal seismic acceleration =	0.69	
Gv = vertical seismic acceleration = 2/3(Gh) =	0.46	
max vertical acceleration = 1 - Gv =	0.54	(downward)
W' = weight of MG set including the motor =	7680	lb
w = weight of steel frame & motor =	2500	lb estimated
W = weight of generator = W' - w =	5180	lb
e = vertical eccentricity =	20	inch
Mx = Mz = W(Gh)e =	71484	in-lb
Fx = Fz = W(Gh) =	3574	lb
Fy =W(1 - Gv) =	2797	lb
s = bolt spacing =	27.5	inch in both direction
n = number of bolts =	4	
T = tension = Mx/(2s) + Mz/(2s) - Fy/n =	1900	lb
$V = [Fx^2 + Fz^2]^{0.5}/n$ =	1264	lb
D = bolt diameter =	0.625	inch, field walkdown
As = tensile area =	0.226	in^2
Ar = root area =	0.207	in^2
Ft = allow tensile stress =	20000	psi
Fv = allow shear stress =	10000	psi
Ta = allow tension = Ft(As) =	4520	lb
Va = allow shear = Fv(Ar) =	2070	lb
interaction = T/Ta + V/Va =	1.03	lb < 1.33 for seismic load

SHEET 3 OF 3


1 SELF SUPPORTING BASE CONSTRUCTION.
RECOMMENDED CONDUIT OPENING LOCATIONS FOR GENERATOR
GENERATOR CONDUIT BOX OPP STD LOCATION CUSTOMER TO CUT REQ'D OPENINGS
TAPPED ½-13 NC-2B x 1" DEEP 2 HOLES FOR GROUND LUG
4" PIPE TAP FOR LEAD OPENING
GENERATOR CONDUIT BOX STANDARD LOCATION CUSTOMER TO CUT REQ'D CONDUIT OPENINGS
FINAL ISSUE
E.B. No. 93210 93-3584
REV. 00 DATE 10/08/20
APPROX WT 7660 LBS
19761138876
F.P. 932105-3584
M-G SET ARRANGEMENT WITH CONDUIT BOXES FACING EACH OTHER TOP VIEW
CONDUIT BOX STANDARD LOCATION
CONDUIT BOX OPPOSITE STANDARD LOCATION
BOTTOM OF BASE NOT MACHINED
.94 DIA 6 HOLES
MOTOR
GEN.
GREASE FITTING
LIFTING PLATE
GROUND PAD
FRONT END
REMOVABLE COVER FOR SERVICING BEARING

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-03 Originating SWC/AWC SWEL-072

Equipment ID No. BATT CHGR 34 Equip. Class 16

Equipment Description Battery Charger

Location: Bldg. CB Floor El. 33'-0 Room, Area

Condition

There is a Unistrut (P1001) frame with two Unistrut columns on both sides of the Battery Charger cabinet with approximately 1" of clearance.

Documents Reviewed

No previous seismic calculation for this condition was found.

Licensing Basis

SSC providing a safety-related function needs to be supported seismically and free from adverse seismic interaction.

Evaluation

The seismic displacement of the Battery Charger and the Unistrut column are determined and added together to see if it is less than the 1" provided.
The evaluation is performed on the next page.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 10-19-2012
Licensing Basis Reviewer

Reviewed by: Joe Ruch Date 10-22-2012
Peer Reviewer

SWEL1-072

Determine if 1" clearance between Battery Charger 34 and P1001 support frame is adequate

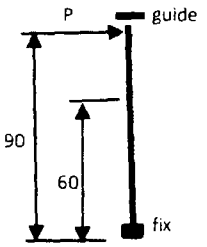
Determine the seismic displacement for Battery Charger:

f = 1st mode frequency =	**8.0**	Hz based on EPRI TR-102180
g = gravitation constant =	**386.4**	
A = peak spectral acceleration based on 5% damping =	**0.344**	at CB EL. 33', 5% damping is recommended by SQUG
d1 = seismic displacement = $g/[2\pi f^2]$ =	0.331	inch based on 1g

Determine the seismic displacement at the P1001 conduit support frame

The frame is an intermediate support for a P1001 beam span across the entire room

For concentrated mass at top of the fix-guided beam:



P = weight of 16' of P1001 lump mass at top of frame =	**60.8**	lb
L = length of vertical P1001 =	**90**	in
x = distance bet. P1001 beam to top of charger =	**30**	in
E = modulus of elasticity =	**27900000**	psi
I = moment of inertia of P1001 =	**0.93**	in^4

Based on a condition of fixed at bottom and guided at top(P1001 is perpendicular to this frame):

d2 = seismic disp = $P(L - x)^2(L + 2x)/(12EI)$ =	0.105	inch based on 1g

For uniform weight along the entire fix-guided beam:

w = uniform weight of P1001 =	**0.317**	#/in
d3 = seismic displacement = $w(L^2 - x^2)^2/(24EI)$ =	2.6E-02	inch based on 1g
d = total seismic displacement = d1+d2+d3 =	4.6E-01	inch < 1 inch, o.k. for seismic interaction

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-04 Originating SWC/AWC SWEL-070

Equipment ID No. BATT CHGR 32 Equip. Class 16

Equipment Description Battery Charger

Location: Bldg. CB Floor El. 33'-0 Room, Area

Condition

The floor is chipped out in the immediate vicinity of one Hilti bolt. The depth of the concrete removal is approximately one inch and extends to the anchor bolt.

Documents Reviewed

Seismic evaluation work sheet (SEWS) for 32CHGR.
SQUG anchorage evaluation for 31CHGR that this battery charger referenced.

Licensing Basis

SSC providing a safety-related function needs to be supported seismically.

Evaluation

The ¾" Hilti bolt still maintains an allowable ~~bolt~~ load kl factor that is greater than 1.0.
The evaluation is performed on the next page.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

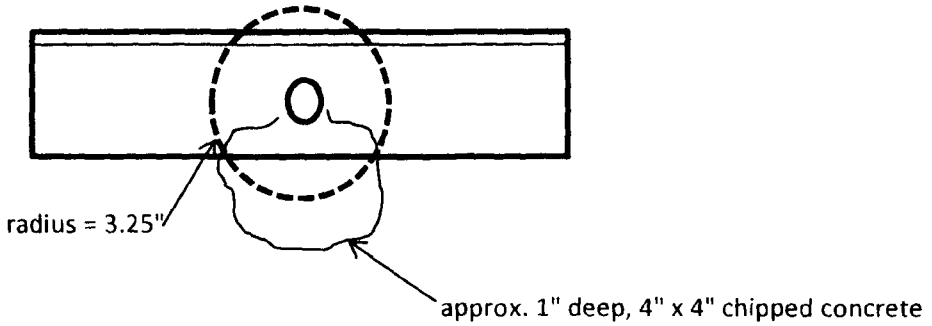
Prepared by: Kai Lo Date 10-19-2012
Licensing Basis Reviewer

Reviewed by: Dan Nuta Date 10-19-2012
Peer Reviewer

SHEET 2 OF 2

SWEL1-070

A 1" deep, 4"x4" chip concrete area adjacent to Hilti bolt



The 1" deep concrete chipped area is conservatively treated to cover 35% of the shear cone area for a 3.25" embedment expansion bolt. The 1" deep, chipped area still has capacity and can be considered as 35% of a shear cone area of a (3.25"-1") = 2.25" embedment anchor.

A1 = 65% of the shear cone area for 3.25" emb = $0.65[\pi(3.25)^2]$ =	21.57	in^2
A2 = 35% of the shear cone area for 2.25" emb = $0.35[\pi(2.25)^2]$ =	5.57	in^2
A = total shear cone area accounting for the 1" chipped area = A1+A2 =	27.14	in^2

A' = original designed shear cone area based on 3.25" emb = $\pi(3.25)^2$ = 33.18 in^2

For shallow embeded (3.5")Hilti bolt, the tensile and shear capacity is governed by concrete.

Since the tensile and shear capacity of the anchor bolt based on concrete is a function of the shear cone,

A capacity reduction factor can be obtained by ratio of the new to orignal shear cone area.

Capacity reduction factor = A/A' =	0.818
From SQUG evaluation	
minimum (allowable) load factor =	1.85 > 1.0, o.k.
new minimum (allowable) load factor =	1.51 > 1.0, o.k.

SWEL1-069 NYPA - INDIAN POINT UNIT 3 Status ◉Y ○N ○U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 1 of 3

Equip. ID No. 31CHGR Equip. Class 16- Battery Chargers & Inverters

Equipment Description BATTERY CHARGER 31

Location: Bldg. CB Floor El. 33'-0" Room Row/Col

Manufacturer. Model. Etc. (Optional but recommended)

SEISMIC CAPACITY VS DEMAND

1. Elevation where equipment receives seismic input			33'-0"
2. Elevation of seismic input below about 40' from grade			Y
3. Equipment has fundamental frequency above about 8 Hz			NA
4. Capacity based on:	Existing Documentation	DOC	ABS
	Bounding Spectrum	BS	
	1.5 X Bounding Spectrum	ABS	
	GERS	GERS	
5. Demand based on:	Ground Response Spectrum	GRS	CRS
	1.5 X Ground Response Spectrum	AGS	
	Conserv. Des. In-Str. Resp Spec.	CRS	
	Realistic M-Ctr. In-Str. Resp. Spec.	RRS	

Does capacity exceed demand? (Indicate at right (*) and in COMMENTS if a special exception to enveloping of seismic demand spectrum is invoked per Section 4.2 of the GIP.) Y

CAVEATS - BOUNDING SPECTRUM (Identify with an asterisk (*) those caveats which are met by intent without meeting the specific wording of the caveat rule and explain the reason for this conclusion in the COMMENTS section below)

1.	Equipment is included in earthquake experience class	Y
2.	Solid State Type	Y
3.	For floor-mounted, transformer positively anchored and mounted near base, or load path is evaluated	Y
4.	Base assembly of floor-mounted unit properly braced or stiffened for lateral forces	Y
5.	For wall-mounted units, transformer supports and bracing provide adequate load path to the rear cabinet wall	NA
6.	All latches and fasteners in doors secured	Y
7.	Anchorage adequate (See checklist below for details)	Y
8.	Relays mounted on equipment evaluated	Y
9.	Have you looked for and found no other adverse concern?	Y
Is the intent of all the caveats met for Bounding Spectrum?		Y

CAVEATS - GERS (Identify with an asterisk (*) those caveats which are met by intent without meeting the specific wording of the caveat rule and explain the reason for this conclusion in the COMMENTS section below)

1	Equipment is included in generic seismic testing equipment class	Y
2.	Meets all Bounding Spectrum caveats	Y
3.	Silicon-Controlled Rectifier (SCR) power controls; wall- or floor-mounted NEMA-type enclosure	Y

Y } Hest 10/13/11

NYPA - INDIAN POINT UNIT 3

Status ◉Y ○N ○U

SCREENING EVALUATION WORK SHEET (SEWS)

Sheet 2 of 3

Equip. ID No. 31CHGR

Equip. Class 16- Battery Chargers & Inverters

Equipment Description BATTERY CHARGER 31

4. Within range of battery charger ratings:	Exicb Battery Charger Model SCRF 130-3-400-C	
24-250 VDC	130 VDC	Y
120-480 VAC	480 VAC	Y
25-600 amps	127 Amps.	Y
150-2850 pounds (floor-mounted)		Y
150-600 pounds (wall-mounted)		N/A
5. Within range of inverter ratings:		N/A
120 VDC only		
120-480 VAC		
0.5-15 KVA		
300-2000 pounds		
6. Heavy components are located in lower half of cabinet and are supported from base or rear panel with no panel cutouts adjacent to attachment		Y
Is the intent of all the caveats met for GERS?		~~NA~~ Y

Yes T 10/13/11 L 10/13/11

ANCHORAGE

1. Appropriate equipment characteristics determined (mass, CG, natural freq., damping, center of rotation)	Y
2. Type of anchorage covered by the GIP	Y
3. Sizes and locations of anchors determined	Y
4. Anchorage installation adequate, e.g., weld quality and length, nuts and washers, expansion anchor tightness	Y
5. Factors affecting anchorage capacity or margin of safety considered: embedment length, anchor spacing, free-edge distance, concrete strength/ condition, and concrete cracking	Y
6. For bolted anchorages, gap under base less than 1/4 inch	Y
7. Factors affecting essential relays considered: gap under base, capacity reduction for expansion anchors	Y
8. Base has adequate stiffness and effect of prying action on anchors considered	Y
9. Strength of equipment base and load path to CG adequate	Y
10. Embedded steel, grout pad or large concrete pad adequacy evaluated	NA
Are anchorage requirements met?	Y

INTERACTION EFFECTS

1. Soft target free from impact by nearby equipment or structures	Y
2. If equipment contains sensitive relays, equipment free from all impact by nearby equipment or structures	Y
3. Attached lines have adequate flexibility	Y
4. Overhead equipment or distribution systems are not likely to collapse	Y
5. Have you looked for and found no other adverse concerns?	Y
Is equipment free of interaction effects?	Y

IS EQUIPMENT SEISMICALLY ADEQUATE? Y

NYPA - INDIAN POINT UNIT 3 Status ◉Y ○N ○U

SCREENING EVALUATION WORK SHEET (SEWS) Sheet 3 of 3

Equip. ID No. 31CHGR Equip. Class 16- Battery Chargers & Inverters

Equipment Description BATTERY CHARGER 31

COMMENTS

REFERENCE DRAWINGS: IP3V-156-5.8-0001, REV. 4 AND 9321-F-30523, REV. 36.
Overall dimension is 76(H)X58(W)X30(D).
Weight is based on GIP recommendation , table C.1-1, of 45 lbs/cubic ft.
Location of C.G. is X=29, Y=-10, Z=42.
Spectral acceleration is for CB building , Elev. 33' at 5% damping, SPA = 0.34g all directions.
Anchorage evaluation is based on 4-3/4" dia. Hilti Kwik Bolts.

Evaluated by: _____ Date: 6/8/95

_____ 6/18/95

Earthquake :

Response Spectrum : User

Frequency : User - 8.00

Damping : User - 5.00

Spectral Values :

Direction	Acceleration (g's)
North - South	0.34
East - West	0.34
Vertical	0.34

Angle : 0.00

Combination Criteria : SRSS

Weights :

Number of Weights : 1

No	Weight	X	Y	Z
1	3.80E+003	2.90E+001	-1.00E+001	4.20E+001

Forces :

Number of Forces : 0

Moments :

Number of Moments : 0

Allowables :

Anchor :

Number of Anchor types : 1

						Tension	Shear	
				Ultimate	Ultimate	Inter	Inter	Saf
No.	Dia	Manufact	Product	Tension	Shear	Coeff	Coeff	Fact
1	3/4	Hilti	Kwik-Bolt (N)	4690.00	5480.00	1.00	0.30	1.00

Concrete :

Ultimate Stress : 3000.00 psi.

Reduction Factor : 0.85

Weld :

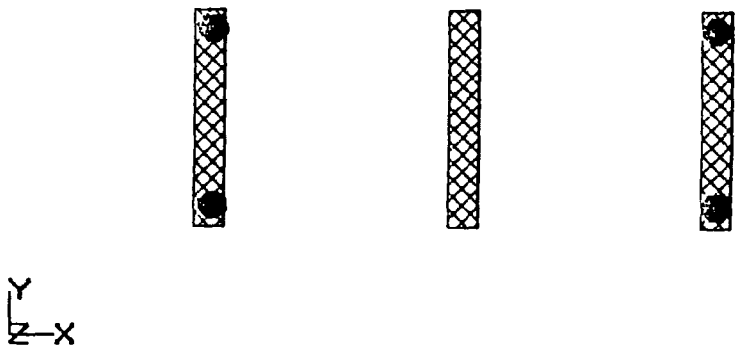
Allowable Stress : 30600 psi.

Surfaces :

Number of Surfaces : 1

	Direction Comp	Direction Comp	Direction Comp
No	Nx	Ny	Nz
1	0.00E+000	0.00E+000	1.00E+000

Anchor Pattern for Surface # 1



Legend for Anchor Patterns

Anchors :

Concrete Lines :

Concrete Points :

Weld Lines :

Geometry :

Anchor :

Number of Anchors : 4

No.	Anch Id	X Coord	Y Coord	Z Coord	Surf Id
1	1	4.00E+000	-2.40E+001	0.00E+000	1
2	1	5.45E+001	-2.40E+001	0.00E+000	1
3	1	5.45E+001	-6.00E+000	0.00E+000	1
4	1	4.00E+000	-6.00E+000	0.00E+000	1

Concrete Lines :

# of elements per line : 4

Number of Concrete Lines : 3

No	Start X-Coord	Start Y-Coord	Start Z-Coord	End X-Coord	End Y-Coord	End Z-Coord	Sf Id	Line Width
1	3.50E+000	-4.00E+000	0.00E+000	3.50E+000	-2.60E+001	0.00E+000	1	3.00E+000
2	5.45E+001	-4.00E+000	0.00E+000	5.45E+001	-2.60E+001	0.00E+000	1	3.00E+000
3	2.90E+001	-4.00E+000	0.00E+000	2.90E+001	-2.60E+001	0.00E+000	1	3.00E+000

Concrete Points :

Number of Concrete Points : 0

Weld Lines :

# of elements per line : 1

Number of Weld Lines : 0

Reduction Factors :

Reduction Factor Input for Anchor # 1

Adequately Installed : Yes
Embedment Length : 3.25, Min:= 3.25 in.
Gap at Threaded Anchor : 0.00 in.
Edge Distance - Edge 1 : 7 50 in.
Crack Size : 0.000 in. - Cracks Affect <= 50% Bolts
Essential Relays in Cabinet : Yes
Base Strength and Load Path : Ok
Embedment Steel and Pads Adequately Installed : Yes

Reduction Factor Input for Anchor # 2

Adequately Installed : Yes
Embedment Length : 3.25, Min:= 3.25 in.
Gap at Threaded Anchor : 0.00 in.

Edge Distance - Edge 1 : 7.50 in.
Crack Size : 0.000 in. - Cracks Affect <= 50% Bolts
Essential Relays in Cabinet : Yes
Base Strength and Load Path : Ok
Embedment Steel and Pads Adequately Installed : Yes

Reduction Factor Input for Anchor # 3

Adequately Installed : Yes
Embedment Length : 3.25, Min:= 3.25 in.
Gap at Threaded Anchor : 0.00 in.
Edge Distance - Edge 1 : 7.50 in.
Crack Size : 0.000 in. - Cracks Affect <= 50% Bolts
Essential Relays in Cabinet : Yes
Base Strength and Load Path : Ok
Embedment Steel and Pads Adequately Installed : Yes

Reduction Factor Input for Anchor # 4

Adequately Installed : Yes
Embedment Length : 3.25, Min:= 3.25 in.
Gap at Threaded Anchor : 0.00 in.
Edge Distance - Edge 1 : 7.50 in.
Crack Size : 0.000 in. - Cracks Affect <= 50% Bolts
Essential Relays in Cabinet : Yes
Base Strength and Load Path : Ok
Embedment Steel and Pads Adequately Installed : Yes

Reduction Factors Data Current : Yes

	Anc	Pall/	Pallr/												
No	Id	Vall	Vallr	RT	RN	RL	RG	RS	RE	RF	RC	RR	RP	RB	RM
1	1	2638.13	N/A	1.00	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.75	1.00	1.00	1.00
		3904.50	N/A	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.75	1.00	1.00	1.00
2	1	2638.13	N/A	1.00	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.75	1.00	1.00	1.00
		3904.50	N/A	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.75	1.00	1.00	1.00
3	1	2638.13	N/A	1.00	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.75	1.00	1.00	1.00
		3904.50	N/A	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.75	1.00	1.00	1.00
4	1	2638.13	N/A	1.00	1.00	1.00	1.00	1.00	1.00	0.75	1.00	0.75	1.00	1.00	1.00
		3904.50	N/A	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.75	1.00	1.00	1.00

Legend :

N/A	= Not Applicable
Pall	= Allowable Pull without Reduced Inspection
Vall	= Allowable Shear without Reduced Inspection
Pallr	= Allowable Pull with Reduced Inspection
Vallr	= Allowable Shear with Reduced Inspection
*	= Outlier
X	= Reduction Factor Not Used
RT	= Reduction Factor for Type of Anchorage
RN	= Reduction Factor for Installation Adequacy

RL	= Reduction Factor for Embedment
RG	= Reduction Factor for Gap at Anchors
RS	= Reduction Factor for Spacing
RE	= Reduction Factor for Edge Distance
RF	= Reduction Factor for Concrete Strength
RC	= Reduction Factor for Concrete Cracks
RR	= Reduction Factor for Essential Relays
RP	= Reduction Factor for Base Stiffness and Prying Action
RB	= Reduction Factor for Base Strength and Load Path
RM	= Reduction Factor for Embed. Steel and Pads

Analysis Results :

Analysis Performed : Yes

Type of Analysis : Regular

	Spectral Accelerations (G's)			Allowable
No	N-S	E-W	Vertical	Load Factor
1	3.40E-001	1.36E-001	1.36E-001	4.379
2	-3.40E-001	-1.36E-001	-1.36E-001	7.205
3	-3.40E-001	1.36E-001	1.36E-001	4.381
4	3.40E-001	-1.36E-001	-1.36E-001	7.190
5	3.40E-001	-1.36E-001	1.36E-001	4.899
6	-3.40E-001	1.36E-001	-1.36E-001	5.162
7	3.40E-001	1.36E-001	-1.36E-001	5.162
8	-3.40E-001	-1.36E-001	1.36E-001	4.901
9	1.36E-001	3.40E-001	1.36E-001	1.848
10	-1.36E-001	-3.40E-001	-1.36E-001	2.981
11	1.36E-001	-3.40E-001	1.36E-001	2.313
12	-1.36E-001	3.40E-001	-1.36E-001	1.966
13	-1.36E-001	3.40E-001	1.36E-001	1.848
14	1.36E-001	-3.40E-001	-1.36E-001	2.981
15	1.36E-001	3.40E-001	-1.36E-001	1.966
16	-1.36E-001	-3.40E-001	1.36E-001	2.313
17	1.36E-001	1.36E-001	3.40E-001	3.990
18	-1.36E-001	-1.36E-001	-3.40E-001	18.073
19	1.36E-001	1.36E-001	-3.40E-001	5.904
20	-1.36E-001	-1.36E-001	3.40E-001	3.641
21	-1.36E-001	1.36E-001	3.40E-001	3.990
22	1.36E-001	-1.36E-001	-3.40E-001	18.153
23	1.36E-001	-1.36E-001	3.40E-001	3.641
24	-1.36E-001	1.36E-001	-3.40E-001	5.904

Minimum Allowable Load Factor : 1.85E+000

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-05 Originating SWC/AWC AWC-19 & 21

Equipment ID No. EDG-1 & EDG33 Equip. Class 16

Equipment Description Emergemcy Diesel Generator

Location: Bldg. DGB Floor El. 15'-0 Room, Area Cell 31 & 33

Condition

The base plate for EDG air intake pipe support PS-A1-1 & A1-2 has a maximum gap of 3/8" to the concrete surface. There is additional bending stress at the ¾" Hilti bolt.

Documents Reviewed

Burns and Roe calculation 6.07.025

Licensing Basis

SSC providing a safety-related function needs to be supported seismically.

Evaluation

The combined normal stress interaction induced by the bending stress resulting from the gap and the tensile stress was evaluated for SSE loading condition and found to be less than 1.0 for the ¾" Hilti bolt. The four bolt anchorage maintains the shear/tensile interaction ratio factor of safety of 10.5, which is more than 5.0.
The evaluation is performed on the next page.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 10-23-2012
Licensing Basis Reviewer

Reviewed by: Dan Nuta Date 10-24-2012
Peer Reviewer

The pipe support beam for air intake pipeing at EDG 31 & 33 has a gap of 3/8" maximum. This beam is for support PS-AI-1 & AI-2. The large gap can cause bending stress at the bolt and needs to be evaluated.

Reference Calculation 6.07.025, page 11		
V = vertical shear =	0.81	kips/bolt
T = tension =	0.43	kips/bolt
d = gap behing base plate =	0.375	in per field walkdown
M = bending moment caused by gap = Vd =	303.75	in-lb
D = Hilti bolt stud diameter =	0.75	in
S = section modulus = $\pi D^3/32$ =	0.041	in^3
fb = bending stress = M/S =	7334	psi
Fb = allowable bending stress = 1.33(0.6)(35000) =	27930	psi
check normal stress at bolt:		
At = tensile stress area =	0.334	in^2
ft = tensile stress = T/At =	1287	psi
Ft = allow tensile stress = 1.33(0.6)(35000) =	27930	psi
steel bolt interaction = ft/Ft + fb/Fb =	0.309	< 1.0, o.k.
Check expansion anchor interaction:		
Per page 11 of Calculation 6.07.025, page 11, safety factor = 10.5 > 5, o.k.		
Based on a safety factor of 5, interaction = 5/10.5 =	0.476	> 1.0, o.k.

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-06 Originating SWC/AWC SWEL1-076

Equipment ID No. DG-31 Equip. Class 17

Equipment Description Diesel Generator No. 31

Location: Bldg. DGB Floor El. 15'-0 Room, Area Cell 31

Condition

1. The lube oil pipe is in contact with the jacket water cooler pipe.
2. Angle iron for support of PI-1561 (31 D/G Crankcase Pressure Indicator) tubing is almost in contact with DF-23-1 PI-1375 (Root Isolation Valve) tubing.

Documents Reviewed

No previous analysis or evaluation located.

Licensing Basis

No adverse seismic interaction between SSC providing a safety-related function.

Evaluation

1. There is no adverse seismic interaction between the lube oil piping and jacket water cooler pipe.
2. There is no adverse seismic interaction between the DF-23-1 PI-1375 tubing and the angle iron.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 10-23-2012
Licensing Basis Reviewer

Reviewed by: D. Nuta Date 10-24-2012
Peer Reviewer

1. The jacket water cooler pipe is in contact with the lube oil pipe. The lube oil pipe extends approximately 8" from the heat exchanger that is rigidly supported. The natural frequency of the lube oil pipe should be in the rigid range, above 33 Hz. The jacket water cooler pipe extends downward approximately 18" from the HX piping, slightly less rigid than the lube oil pipe because of the two couplings. The two heat exchangers and the EDG are on the same foundation. The seismic displacement for the two pipes during postulated occurrence of a seismic event should be of very small magnitude due to their rigid behavior. The jacket water pipe will rotate slightly at the coupler to give way to accommodate the displacement of the lube oil pipe. The seismic interaction will not be an adverse one.
2. The angle iron is rigidly supported with approximately 6" cantilever length and there are no sharp edges. During a seismic event, the tubing will vibrate and rub against the flat surface of the angle iron for 20 seconds or so. For such a small mass and short period of time, there will be no adverse seismic interaction between the tubing and the angle iron as the forces developed at the interface will be very small.

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-07 Originating SWC/AWC SWEL1-096

Equipment ID No. EDG-31-FO-TNK Equip. Class 21

Equipment Description 31EDG Fuel Oil Day Tank

Location: Bldg. DGB Floor El. 26'-0 Room, Area Cell 31

Condition

There are two saddles supporting the tank, each with 4 bolts. Two of 4 bolts on the north saddle, one at each end of the saddle are missing nuts.

Documents Reviewed

The SEWS anchorage evaluation was not in image file in MERLIN, consequently considered as no evaluation.
Drawing IP3V-0353-001

Licensing Basis

SSC providing a safety-related function must be seismically supported to maintain its function during and after a seismic event .

Evaluation

The anchor bolts are structurally adequate without the two nuts.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 10-24-2012
Licensing Basis Reviewer

Reviewed by: Dan Nuta Date 10-25-2012
Peer Reviewer

SWEL1 NO. 96

Check bolt at the saddle with 2 out of 4 nuts missing

Building : DGB EL. 15', located on a platform ~ EL. 27',

Conservatively using peak of 0.5% damping response spectra at EL. 48'

Gh = horizontal seismic acceleration =	0.98	
Gv = vertical seismic acceleration = 2/3(Gh) =	0.653	
max vertical acceleration = 1 - Gv =	0.347	(downward)
W = weight of Fuel Oil Day Tank =	2220	lb
MRM = multi-modal response multiplier =	1.5	
e = vertical eccentricity =	15	inch
Mx = Mz = W(MRM)(Gh)e =	48951	in-lb
Fx = Fz = W(MRM)(Gh) =	3263	lb
Fy =W(1 - Gv) =	770	lb (downward)
s1 = spacing between bolts at each saddle =	22.5	inch
s2 = spacing between saddle =	30	inch
n = number of bolts for shear at each saddle =	4	
n' = number of bolts for tension at saddle that has nuts =	2	
T' = tension at each saddle bolt location = Mx/(2s1) + Mz/(s2) - Fy/4 =	2527	lb
T = tension per bolt = T'/n' =	1264	lb
V = shear per bolt =$[Fx^2 + Fz^2]^{0.5}$/n =	1154	lb
D = bolt diameter =	0.75	inch,
As = tensile area =	0.334	in^2
Ar = root area =	0.309	in^2
Ft = allow tensile stress =	20000	psi
Fv = allow shear stress =	10000	psi
Ta = allow tension = Ft(As) =	6680	lb
Va = allow shear = Fv(Ar) =	3090	lb
interaction = T/Ta + V/Va =	0.75	< 1.33 for seismic load

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-08 Originating SWC/AWC SWEL 1-076

Equipment ID No. DG-31 Equip. Class 17

Equipment Description DIESEL GENERATOR NO. 31

Location: Bldg. DG Floor El. 15'-0" Room, Area *31 DIESEL GENERATOR ROOM*

Condition

Observed a tight crack passing through a bolt for a fire protection support at the southeast corner of the room. Photo attached in IP3 SWEL 1-076.

Documents Reviewed

1. DBD-310, "Design Basis Document for Seismic Piping and Supports"
2. EPRI NP-5228-SL, "Seismic Verification of Nuclear Power Plant Equipment Anchorage" Volume 1

Licensing Basis

In seismic class I building such as Emergency Diesel Generator Building, the fire protection piping must be designed for II over I seismic interaction.

Evaluation

Based on SQUG criteria per EPRI NP-5228-SL, Revision 1, Volume 1, Table 2.16, where the crack width is between 10 mills and 20 mills, a factor of safety of 4 is adequate for expansion anchor integrity. It is judged that the crack under observation falls into this width range and since plant procedure is to design to a safety factor of 4, the condition is determined to be acceptable. In addition, this is a four bolt base plate and supports a small diameter fire water line. It is judged that the gravity plus seismic loads applied to the bolts would result in a factor of safety significantly greater than 4.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 10-26-2012
Licensing Basis Reviewer

Reviewed by: Paul H. C PAUL HUEBSCH Date 11/26/12
Peer Reviewer

ATTACHMENT 9.9 LICENSING BASIS EVALUATION FORMS AND INSTRUCTIONS
Sheet 1 of 3

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-09 Originating SWC/AWC AWC-14

Equipment ID No. N/A Equip. Class N/A

Equipment Description N/A

Location: Bldg. AFPB Floor El. 43'-0" Room, Area

Condition

A conduit have a span of 16 feet between the floor and the next support. Determine the stress and whether there is any seismic interaction concern.

Documents Reviewed

No design document is found.

Licensing Basis

In seismic class I building such as AFP Building, the rigid conduit raceway must be designed for seismic interaction.

Evaluation

The stress at the 2" vertical conduit is below the allowable stress limit.
The seismic displacement is small and the seismic interaction effect is insignificant.
The evaluation is shown on the next page.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 10-31-2012
Licensing Basis Reviewer

Reviewed by: Richard Drake Date 10-31-2012
Peer Reviewer

AWC NO 14

Vertical conduit (2")may have a missing support, check max supported span
Conservative to neglect the restraining effect of the existing Unistrut support.

L =	16	ft, cons. estimated	
w =	4.91	plf = 0.409	#/inch

Location: AFPB EL. 43', use peak G value from 0.5% damping response respectra

Gh =	1.09		[Ref. 1]
MRM =	2.0		
Gv = 2Gh/3 =	0.727		
D = outside diameter =	2.375	in	[Ref. 2]
d = inside diameter =	2.083	in	
S = section modulus = $0.0982[D^4 - d^4]/D$ =	0.537	in^3	
I = moment of inertia = $0.0491[D^4-d^4]$ =	0.638	in^4	
E = modulus of elasticity =	29000000	psi	
$M = wL^2/12$ =	1257.0	in-lb	
Since conduit is vertical, $Gr = MRM(2Gh^2)^{0.5}$ =	3.083		
fb = Gr(M)/S =	7215	psi , 1.33(0.6)(35000) = 27930 psi	
d = displacement = $Gr(wL^4)/(384EI)$ =	0.241	in	

Since the displacement is small, the seismic interaction effect on the adjacent items is insignificant.

Reference:

1. CES-2A, Rev. 2
2. B-Line Strut SystemCatalog SS99

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-10 Originating SWC/AWC SWEL-054

Equipment ID No. CCRAC31 Equip. Class 11

Equipment Description Control Room AC Unit 31

Location: Bldg. CB Floor El. 15'-0 Room, Area CCRAC room

Condition

A Unistrut channel that has a cantilever length of 48" has a 3/8" tubing inside the channel. The cantilever end of the channel has a duct tape. There is a need to investigate the stress, deflection of the Unistrut channel and determine if there is any adverse seismic interaction if there is contact.

Documents Reviewed

No previous seismic calculation for this tubing was found.

Licensing Basis

Tubing providing a safety-related function needs to be supported seismically. The tubing support must be designed seismically. Both the tubing and support stress must be designed to the B31.1 and AISC codes and standards.

Evaluation

The tubing is supported by the Unistrut channel. Since the channel has a long cantilever, the stress, displacement for the channel, and the channel induced displacement load onto the tubing need to be evaluated.
A new evaluation is performed on the next page.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 11-1-2012
Licensing Basis Reviewer

Reviewed by: CHIMAN PATEL / Chiman Patel Date 11-1-2012
Peer Reviewer

SWEL1 - 054

L = cantilever length of Unistrut channel =	48	in		
w = uniform weight of Unistrut channel =	1.9	plf =	0.1583	#/in
Use w =	0.18	#/in	, cons. to include weight of tube	
S = min. section modulus =	0.203	in^3		
I = min. moment of inertia =	0.186	in^4		
E = modulus of elasticity =	2.90E+07	psi		
At Control building EL. 33', use 0.5% damping response spectrum				
Gh = peak horizontal acceleration =	0.69			
Gv =(2/3)Gh =	0.460			
The Unistrut P1000 has a vertical orientation				
Gr = resultant of acceleration = $[2Gh^2]^{0.5}$ =	0.98			
MRM = multi-modal response multiplier =	1.50			
M = bending moment = $wL^2/2$ =	207.4	in-lb		
fb = bending stress = MRM(Gr)(M/S) =	1495	psi < 1.33(25000) =	33250	psi, o.k.
Check deflection at cantilever end				
d = deflection = MRM(Gr)[$wL^4/(8EI)$] =	0.032	inch		
D = diameter of tubing =	0.375	inch		
t = wall thickness of tubing =	0.065	inch		
d = inside diameter of tubing = D - 2t =	0.245	inch		
S_t = section modulus of 3/8" tubing = $0.0982[D^4-d^4]/D$ =	0.00424	in^3		
I_t = moment of inertia of tubing = $S_c(0.5D)$ =	0.0007941	in^4		

For a simple support beam with force at mid-span, length = 60 in

$M = 12EI_td/L^2$

fb = $M/S_t = 12EI_td/(S_tL^2)$ =	587	psi << 1.8(15000psi) =	27000psi

Since the seismic displacement is small, any tubing bending stress resulted from the 0.032" forced displacement loading on a flexible tubing system will not be significant.

ATTACHMENT 9.9 LICENSING BASIS EVALUATION FORMS AND INSTRUCTIONS
Sheet 1 of 3

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-11 Originating SWC/AWC SWEL-095

Equipment ID No. COND STOR TK Equip. Class 21

Equipment Description Condensate Storage Tank (31 CST)

Location: Bldg. YD Floor El. 69'-0 Room, Area

Condition

A lighting pole is next to the tank. Determine the seismic interaction between the light pole and the CST.

Documents Reviewed

No previous seismic calculation for this condition was found.

Licensing Basis

Safety-related function of the CST must not be impaired by non-safety related equipment such as a light pole.

Evaluation

The lighting pole will withstand a design basis seismic event and will not overturned or collapsed onto the CST.
A new evaluation is performed on the next page.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 11-5-2012
Licensing Basis Reviewer

Reviewed by: CHIMAN PATEL/chiman patel Date 11-6-2012
Peer Reviewer

SHEET 2 OF 3

SWEL-095

Determine if the seismic bending moment is less than wind induced design bending moment

t = assumed thickness of the pole =	0.12	inch =	0.0100	ft	
determine weight of horizontal pole:					[Ref. 1]
L1 = length of horizontal pole = $[1.7^2 + 9^2]^{0.5}$ =	9.16	ft			

Assume the horizontal pole is 6" on one end and 3.5" on the other end,

D1 = average diameter of horizontal pole = 0.5(6"+3.5")/12 =	0.396	ft
W1 = weight of horizontal pole = (D1)π(L1)t(165pcf) =	18.79	lb

determine weight of vertical pole:			[Ref. 1]
L2 = length of vertical pole =	26.34	ft	

Assume the vertical pole is 9" on one end and 6" on the other end,

D2 = average diameter of horizontal pole = 0.5(9"+6")/12 =	0.625	ft
W2 = weight of vertical pole = (D2)π(L2)t(165pcf) =	85.34	lb

W3 = weight of lighting assembly =	50	lb assumed	
L3 = c.g. of lighting assembly to vertical pole =	9	ft estimated	[Ref. 1]

Using the peak G value from the 0.5% damping ground response spectra curve

Gh = horizontal DBE seismic acceleration =	0.64	
Gv = vertical DBE seismic acceleration = (2/3)Gh =	0.427	

Determine bending moment at the ground elevation:

M1= bending moment induced by W1 = W1(Gv)(0.5L1) + W1(1.41Gh)(L2 -0.5 + 2')
= 508.86 ft-lb

M2 = bending moment induced by W2 = W2(1.41GH)(0.5L2 + 2')
= 1168.19 ft-lb

M3= bending moment induced by W3 = W3(Gv)(L3) + W3(1.41Gh)(L2 -0.5 + 2')
= 1448.141 ft-lb

M = total seismic induced bending moment = M1+M2+M3 = 3125.2 ft-lb

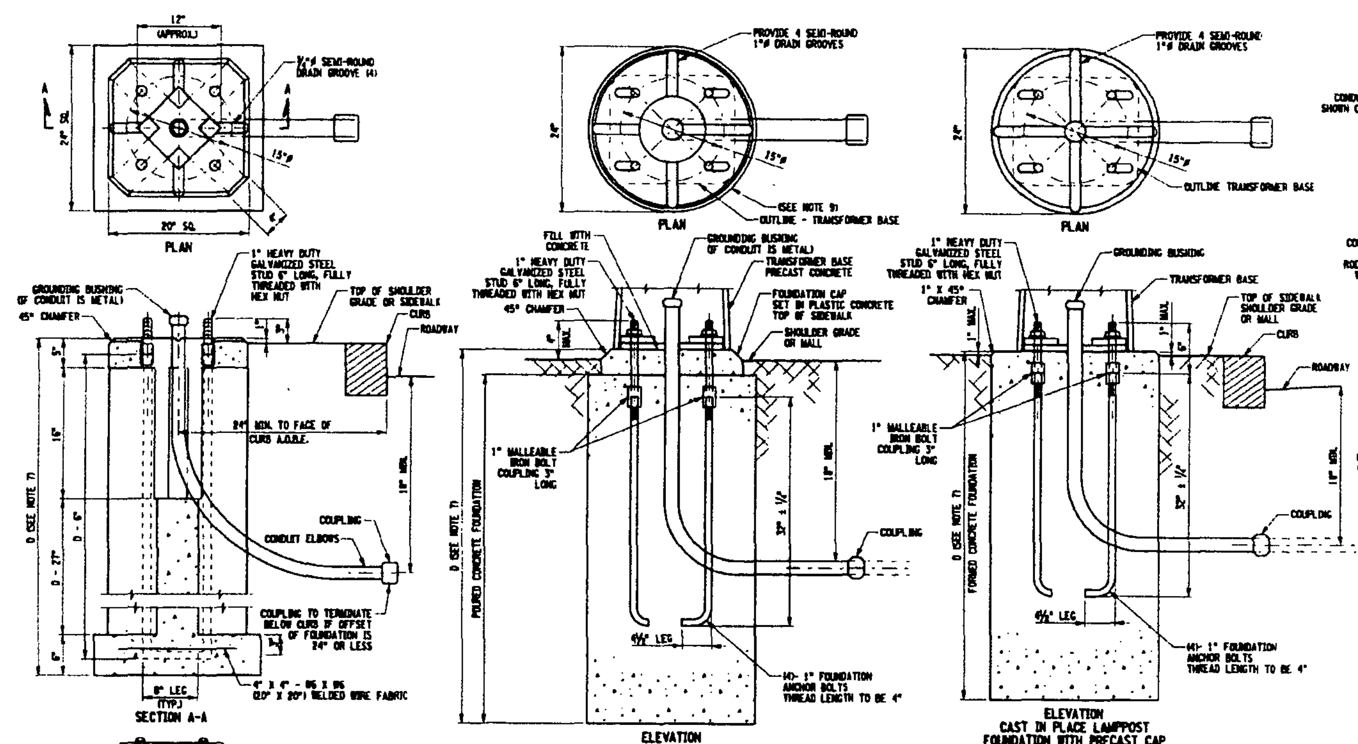
Based on state of NY dept of transportation for lamp post foundation:

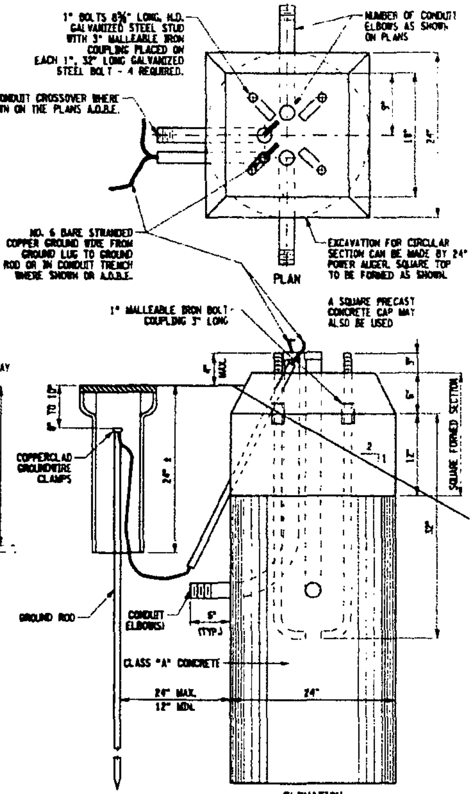
For 30' long lamp post, design moment capacity = 11065 ft-lb [Ref. 2]

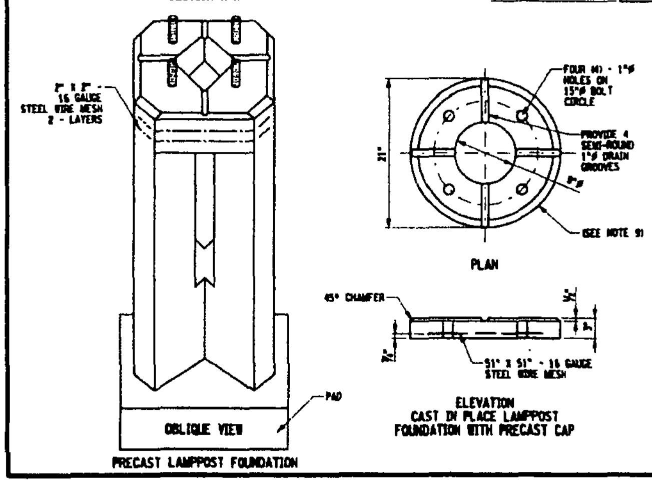
Since the design moment of foundation has a minimum safety factor of 1.5 versus the applied moment, i.e. 7300 ft-lb, and the seismic induced bending moment is less, the pole will not bend over, or overturn and collapsed on the CST tank during a seismic event.

Reference

1. Drawing 9321-F-30253
2. State of NY Department of Transportation, "Lamppost Foundation", 670-01, 670-02, 670-03







NOTES:

1. THE PRECAST LAMPPOST FOUNDATION DETAIL IS A RECOMMENDED DESIGN. OTHER DESIGNS FOR PRECAST LAMPPOST FOUNDATIONS MEETING THE FOLLOWING CRITERIA WILL ALSO BE CONSIDERED UPON SUBMITTAL OF SHOP DRAWINGS AND CALCULATIONS.
   MOMENT TO RESIST:
   30' POLE - 11,065 LB. \ FT.
   40' POLE - 16,965 LB. \ FT.
   50' POLE - 24,505 LB. \ FT.
2. TORQUE TO RESIST : 1035 LB. \ FT. - MINIMUM COVER REINFORCEMENT: 2"
3. INSTEAD OF THE LEG AT THE BOTTOM OF EACH ANCHOR BOLT, THE CONTRACTOR MAY USE 3 FLAT WASHERS SANDWICHED BETWEEN TWO HEAVY HEX NUTS TO DEVELOP THE FULL STRENGTH OF THE ANCHOR BOLTS.
4. THE FOUNDATION SHALL MEET THE REQUIREMENTS OF § 723-45 OF THE STANDARD SPECIFICATIONS AND SHALL BE CONSTRUCTED BY A MONOLITHIC PLACEMENT OF CONCRETE, EXCEPT FOR THE PRECAST CAP OR SQUARE FORMED SECTION.
5. THE FOUNDATION SHALL BE CONSTRUCTED ACCORDING TO THE REQUIREMENTS OF § 670-3.04 OF THE STANDARD SPECIFICATIONS.
6. THE CONTRACTOR SHALL CAP CONDUIT ELBOWS WHERE CONDUIT IS INSTALLED BY OTHERS. GROUNDING BUSHING SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR INSTALLING LAMPPOST.
7. CONCRETE FOUNDATION DEPTH "D"

POLE HEIGHT	GROUND SLOPE	GROUND WATER BELOW BOTTOM OF FOUNDATION	GROUND WATER MORE THAN 2'-0" BELOW SURFACE	GROUND WATER LESS THAN 2'-0" BELOW SURFACE
≤ 30'	≤ 1:4	5'	6'	7'
≤ 30'	> 1:4	6'	7'	8'
31' TO 50'	≤ 1:4	6'	7'	8'
31' TO 50'	> 1:4	7'-6"	8'-6"	8'-6"

* APPLIES TO SUBMERGED CONDITIONS ONLY, NOT TO SLOPE SUBJECT SEEPAGE.
THE REGIONAL SOILS ENGINEER SHOULD BE CONSULTED TO PROVIDE AN ESTIMATE OF THE ANTICIPATED GROUNDWATER ELEVATION AND TO IDENTIFY AREAS WHICH MAY CONTAIN ORGANIC DEPOSITS, SOFT CLAY, OR RANDOM FILLS.

NOTES CONTINUED:

8. ALL LAMPPOSTS SHALL BE GROUNDED EITHER THROUGH THE METAL CONDUIT, BURIED GROUNDWIRE IN TRENCH, OR VERTICAL GROUNDROD. SEE STANDARD SHEET TITLED "PULLBOX CONDUIT AND GROUND ROD INSTALLATION DETAILS" FOR ADDITIONAL GROUNDING NOTES AND DETAILS.
9. IF TOP OF FOUNDATION IS FORMED SQUARE, THE PRECAST CAP SHALL BE SQUARE.
10. PAYMENT FOR EXCAVATION, LABOR, PIPE TILE, FRAME AND COVER IS TO BE INCLUDED AS PART OF THE FOUNDATION.

EFFECTIVE DATE: 01/08/09

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

U.S. CUSTOMARY STANDARD SHEET

LAMPPOST FOUNDATIONS

APPROVED SEPTEMBER 19, 2008
/S/ DANIEL D'ANGELO, P.E.
DEPUTY CHIEF ENGINEER
DESIGN

ISSUED UNDER EB 08-036

670-01

ATTACHMENT 9.9 LICENSING BASIS EVALUATION FORMS AND INSTRUCTIONS
Sheet 1 of 3

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-12 Originating SWC/AWC AWC-028

Equipment ID No. _____ Equip. Class _____

Equipment Description _____

Location: Bldg. PAB Floor El. 55'-0 Room, Area _____

Condition

A camera support base plate does not have any anchor bolt. Need to see if the support can overturn during a seismic event.

Documents Reviewed

No previous seismic calculation for this condition was found.

Licensing Basis

Non-safety related equipment such as a camera support in a Seismic Class I building must not induce adverse seismic interaction with Safety-related equipment. The support must be seismically designed for II over I interaction.

Evaluation

The camera support can not overturn during a design basis seismic event. A higher safety factor is desirable.
The new evaluation is performed on the next page.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 11-7-2012
Licensing Basis Reviewer

Reviewed by: Joseph Ruch Date 11-7-12
Peer Reviewer

AWC- 28

Camera on a pole with a base plate that has no anchor bolts

L = cantilever length of camera support pole =	75	inch, measured
W1 = weight of camera =	7	lb estimated
B = dimension of square baseplate =	18	inch
W2 = weight of 1.5" square pole & angle bracket =	12	lb estimated for 0.09" thk.
W3 = weight of baseplate =	45	lb (1/2" thick plate)

For PAB EL. 55', peak G from 2% damping response spectra is used because of bolted structure

Gh =	0.42	
Gv = (2/3)Gh =	0.28	
[1 - Gv] =	0.72	downward
M = applied overturning moment = Gh[W1(L) + 0.5W2L] =	410	in-lb
Mr = resisting moment =[1-Gv](W1+W2+W3)(0.5B) =	415	in-lb

Since resisting moment is greater than overturning moment , the camera pole assembly can not overturn. It is desirable to have a higher safety factor against overturning.

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-13 Originating SWC/AWC AWC-27

Equipment ID No. SWEL1-029 Equip. Class 6

Equipment Description 32 RHR Pump

Location: Bldg. PAB Floor El. 15'-0 Room, Area

Condition

A 4" liquid waste disposal pipe adjacent to the east wall has a 25' to 30' span.

Documents Reviewed

No previous seismic calculation for this condition was found.

Licensing Basis

Piping adjacent to safety related equipment needs to be seismically designed for II over I interaction .

Evaluation

The pipe stress is well below the B31.1 code limit. The piping will not have any adverse II over I interaction during a design basis seismic event.
The new evaluation is performed on the next page.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 11-6-2012
Licensing Basis Reviewer

Reviewed by: CHIMAN PATEL Chiman Patel Date 11-6-2012
Peer Reviewer

AWC- 27

Liquid Waste pipe has 25' to 30' span length

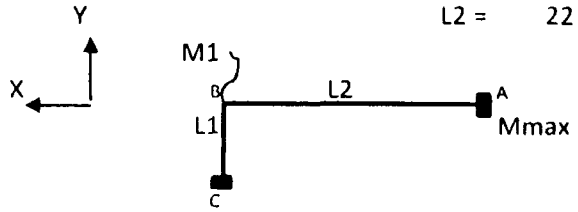
D = pipe outside diameter =	4.5	inch
t = wall thickness for sch 40 pipe =	0.237	inch
S = section modulus of 4" Sch 40 pipe =	3.21	in^3
w = uniform weight of pipe and water =	16.3	plf
P = design pressure =	150	psi
i =SIF of 4" LR elbow =	1.95	

For PAB EL. 43', 0.5% damping response spectra

Gh = peak horizontal seismic acceleration =	0.63	
MRM = multi-modal response multiplier =	2.0	
Gv = (2/3)Gh =	0.42	

Base on fixed-fixed end condition:

L1 =	8	ft
L2 =	22	ft



For dead weight normal loading

Treat the beam AB as fixed-fixed with one length of L2 in the Y direction

L = L2 =	22	ft
At point A, Mmax = $wL^2/12$ =	7889.2	in-lb
At point B, M1 = $wL^2/12$ =	7889.2	in-lb
M_a = max(Mmax, M1) =	7889.2	in-lb
PD/(4t) + 0.75i(Ma/S) =	3169.7	psi , 0.75i = 1.0
Sh = allow pipe stress for A312 Tp304 material =	15950	psi , o.k.
PD/(4t) + 0.75i(M1/S) =	4306	psi < Sh, o.k.

For vertical seismic

MRM(Gv) =	0.84	
At point A, M_{bva} = MRM(Gv)Mmax =	6626.9	in-lb
At point B, M_{bvb} = MRM(Gv)M1 =	6626.9	in-lb

For horizontal seismic loading in Z direction

Treat the beam AC as fixed-fixed with one length of (L1+L2) in the Z direction

MRM(Gh) = 2Gh =	1.26	
L = L1+L2 =	30	ft
Mmax = $wL^2/12$ =	14670	in-lb
At point A, M_{bhA} =MRM(Gh)Mmax =	18484.2	in-lb
At point B, x = L2, M_{bhB} = MRM(Gh)(6Lx - L^2 -6x^2)(w/12) =	3203.9	in-lb

Bending moment at point A is higher

M_b = SRSS(M_{bvA}, M_{bhA}) =	19636.2	in-lb

Combining DW + seismic DBE

Ma + Mb =	27525.4	in-lb
$PD/(4t) + 0.75i(M_a+M_b)/S$ =	9287	psi , 0.75i = 1.0
1.8Sh =	28710	psi, o.k.

Pipe is structurally adequate per B31.1 code requirement.

ATTACHMENT 9.9 LICENSING BASIS EVALUATION FORMS AND INSTRUCTIONS
Sheet 1 of 3

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-14 Originating SWC/AWC AWC-32

Equipment ID No. SWEL1-026 Equip. Class 6

Equipment Description Boric Acid Transfer Pump

Location: Bldg. PAB Floor El. 55'-0 Room, Area

Condition

A 1.5" (1.9" O.D.) , threaded hot water pipe from area heater UH335 has a long 15 feet span adjacent to the wall.

Documents Reviewed

No previous seismic calculation for this condition was found.

Licensing Basis

Safety-related function of nearby equipment must not be impaired by non-safety related equipment such as the hot water heater piping.

Evaluation

The pipe stress is well below the B31.1 code limit. The piping will not have any adverse II over I interaction during a design basis seismic event.
The new evaluation is performed on the next page.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 11-6-2012
Licensing Basis Reviewer

Reviewed by: CHIMAN PATEL Date 11-6-2012
Peer Reviewer

AWC- 32

Hot water heater pipe (1.9" OD) with 15 feet pipe span along the wall

D = pipe outside diameter =	1.9	inch
t = wall thickness for sch 40 pipe =	0.145	inch
S = section modulus of 4" Sch 40 pipe =	0.326	in^3
w = uniform weight of pipe and water =	3.60	plf
P = design pressure =	150	psi, cons.
i =SIF of threaded pipe =	2.3	
L = span length of pipe =	15	ft
For PAB EL. 72', 0.5% damping response spectra		
Gh = peak horizontal seismic acceleration =	0.75	
MRM = multi-modal response multiplier =	2.0	
Gv = (2/3)Gh =	0.5	

Base on fixed-fixed end condition:

For dead weight normal loading

Treat the beam AB as fixed-fixed with length of L in the Y & Z direction

L =	15	ft
At point A, Mmax = $wL^2/12$ =	810	in-lb
M_a = Mmax =	810	in-lb
PD/(4t) + 0.75i(Ma/S) =	4777	psi , 0.75i = 1.725
Sh = allow pipe stress for A53 Gr B, CS material =	15000	psi , o.k.

For seismic loading

Gr = SRSS of vertical and horizontal seismic acceleration =	0.9014	
MRM(Gr) =	1.803	
At point A, M_b = MRM(Gv)Mmax =	1460.2	in-lb

Combining DW + seismic DBE

Ma + Mb =	2270.2	in-lb
PD/(4t) + 0.75i(M_a+M_b)/S =	12504	psi
1.8Sh =	27000	psi, o.k.

Pipe is structurally adequate per B31.1 code requirement.

ATTACHMENT 9.9 LICENSING BASIS EVALUATION FORMS AND INSTRUCTIONS

Sheet 1 of 4

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-15 Originating SWC/AWC AWC-33

Equipment ID No. SWEL2-001 Equip. Class 6

Equipment Description Refueling Water Purification Pump

Location: Bldg. PAB Floor El. 41'-0 Room, Area

Condition

A 1.5" (1.9" O.D.) , vertical PCV vent pipe (adjacent to the purification pump) has a long 12 feet span going into the HVAC duct.

Documents Reviewed

No previous seismic calculation for this condition was found.

Licensing Basis

Safety-related function of nearby equipment must not be impaired by non-safety related equipment such as the PVC vent pipe.

Evaluation

The pipe stress is below the allowable stress limit. The piping will not have any adverse II over I interaction during a design basis seismic event. The existing tie-wrap should be changed to a pipe clamp.
The new evaluation is performed on the next page.

Conclusion (8) Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 11-7-2012
Licensing Basis Reviewer

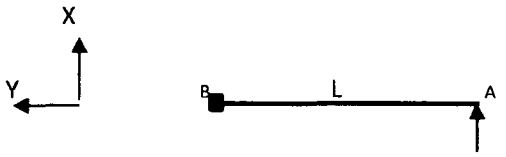
Reviewed by: CHIMAN PATEL /Chiman Patel Date 11-8-2012
Peer Reviewer

AWC- 33

PVC vent pipe (1.9" OD) with approximately 12 feet pipe span
The pipe is supported at one end from the wall and the other is at the duct

D = pipe outside diameter =	1.9	inch
t = wall thickness for sch 40 pipe =	0.145	inch
S = section modulus of 4" Sch 40 pipe =	0.326	in^3
w = uniform weight of pipe =	0.537	plf
P = design pressure =	50	psi, cons.
i =SIF of threaded pipe =	2.3	, used conservatively
L = span length of pipe =	12	ft
For PAB EL. 72', 0.5% damping response spectra		
Gh = peak horizontal seismic acceleration =	0.66	
MRM = multi-modal response multiplier =	2.0	
Gv = (2/3)Gh =	0.44	

Base on fixed-fixed end condition:



The pipe came out from the wall with a short span, considered the pipe has a fixed condition. The pipe then goes up vertically to the duct, consider this end as pin.

Stress induced by y directional loading, i.e. dead weight and vertical seismic will be low, and is negligible.
Treat the beam AB as pin-fixed with length of L in the X & Z direction

For seismic loading		
Gr = SRSS of two horizontal seismic acceleration = 1.41Gh =	0.9306	
MRM(Gr) =	1.861	
Mmax = $wL^2/8$ =	115.99	in-lb
M_b = MRM(Gr)Mmax =	215.9	in-lb
Combining DW + seismic DBE		
Ma = bending moment from DW =	0	in-lb
Ma + Mb =	215.9	in-lb
$PD/(4t) + 0.75i(M_a+M_b)/S$ =	1306	psi
Consider the allowable stress for PVC pipe as	1600	psi, based on safety factor= 2.5

For a temporary seismic loading, increase the allowable stress by 1.33 would result in SF=1.88

Allowable stress for seismic loading = 1.33(1600) =	2128	psi, o.k.

Pipe is structurally adequate.

Allowable Longitudinal Bending

When installing PVC pipe, some changes in alignment of the pipe may be accomplished without the use of elbows, sweeps, or other direction-change fittings. Controlled longitudinal bending of the pipe within acceptable limits can be accommodated by PVC pipe itself. Longitudinal deviation of the pipeline can be accommodated through either joint offset or axial flexure (curving) of the pipe. *Curving of PVC pipe may increase the possibility of failures during tapping under pressure. Whenever practicable, taps should be made on the inside radius of longitudinally bent pipe.*

Permissible joint offset may be significant when gasketed joints that are designed for such a purpose are provided on the PVC pipe. Depending on pipe size and joint design, the offset per joint for gasketed PVC pipe joints in the unstressed condition varies from approximately ⅓° to 5°. Available joint offset is dependent upon insertion depth of the spigot. Assembly should be made only to the mark provided. "Homed" or over-inserted assemblies allow for no flexibility. Some manufacturers encourage joint offset only for accommodation of laying water pipe not to grade, with fittings to be used for known changes in direction. Joint offset limits should be obtained from the manufacturer for joints that are to be stressed to the permissible limit without leakage.

Mathematical relationships for the longitudinal bending of pressurized tubes have been derived by Reissner. These relationships compare favorably to those of Timoshenko and others. One critical limit to bending of PVC pipe is long-term flexural stress. Axial bending also causes a very small amount of ovalization or diametric deflection of the pipe.

AWWA PVC pipe has short-term strengths of 7,000-8,000 psi (48.26-55.16 MPa) in tension and 11,000-15,000 psi (75.84-103.42 MPa) in flexure. The long-term strength of PVC pipe in either tension, compression, or flexure can conservatively be assumed to equal the hydrostatic design basis *HDB* of 4,000 psi (27.58 MPa). Applying a 2.5:1 safety factor results in an allowable long-term tensile or flexural stress equal to the recommended hydrostatic stress *S* of 1,600 psi (11.03 MPa) for AWWA C900 PVC pipe at 73.4° F (23° C). The 2:1 safety factor used for AWWA C905 PVC pipe similarly yields a hydrostatic stress of 2,000 psi (13.79 MPa). However, the bending of PVC pipe barrels larger than 12 in. (300 mm) is usually not recommended because of the forces required. Either the 1,600 psi (11.03 MPa) or 2,000 psi (13.79 MPa) figure may be used for the allowable long-term flexural stress in gasketed joint pipe that is free of longitudinal stress from internal pressure longitudinal thrust. However, when the joints are restrained as in solvent cementing, without snaking the pipe in the trench, then the end thrust from internal pressure imposes a longitudinal tensile stress equal to one-half of the hoop stress.

The equation for allowable bending stress S_b is

$$S_b = (HDB - S_t)\frac{T'}{SF} \qquad (4\text{-}13)$$

Where:

HDB = hydrostatic design basis of PVC pipe, psi [4,000 psi (27.58 MPa) for AWWA C900 and C905]

S_t = HDB/2 = tensile stress from longitudinal thrust, psi

T' = temperature rating factor (see Table 5-1)

SF = safety factor (2.5 or 2.0 as applicable)

NOTE: The longitudinal stress from thermal expansion and contraction can be ignored in buried gasketed joint piping because of relaxation of the soil restraint over the length between joints. When determining bending limits, longitudinal thermal stresses should be considered in restrained pipes, such as lines with solvent-cemented joints and restrained and supported piping.

Softening Starts (approx.)	250°F	
Material Becomes Viscous	350°F	
Material Carbonizes	425°F	
Limiting Oxygen Index (LOI)	43	ASTM D2863
Clean Room Materials Flammability Test	N/A	FM 4910

SCHEDULE 40 & 80 - DIMENSIONS

Schedule 40 Dimensions

Nom. Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nom. Wt./Ft.	Max. W.P. PSI**
1/8"	0.405	0.249	0.068	0.051	810
1/4"	0.540	0.344	0.088	0.086	780
3/8"	0.675	0.473	0.091	0.115	620
1/2"	0.840	0.602	0.109	0.170	600
3/4"	1.050	0.804	0.113	0.226	480
1"	1.315	1.029	0.133	0.333	450
1-1/4"	1.660	1.360	0.140	0.450	370
1-1/2"	1.900	1.590	0.145	0.537	330
2"	2.375	2.047	0.154	0.720	280
2-1/2"	2.875	2.445	0.203	1.136	300
3"	3.500	3.042	0.216	1.488	260
3-1/2"	4.000	3.521	0.226	1.789	240
4"	4.500	3.998	0.237	2.118	220
5"	5.563	5.016	0.258	2.874	190
6"	6.625	6.031	0.280	3.733	180
8"	8.625	7.942	0.322	5.619	160
10"	10.750	9.976	0.365	7.966	140
12"	12.750	11.889	0.406	10.534	130
14"	14.000	13.073	0.437	12.462	130
16"	16.000	14.940	0.500	16.286	130
18"	18.000	16.809	0.562	20.587	130
20"	20.000	18.743	0.593	24.183	120
24"	24.000	22.544	0.687	33.652	120

Schedule 80 Dimensions

Nom. Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nom. Wt./Ft.	Max. W.P. PSI**
1/8"	.405	.195	0.095	0.063	1230
1/4"	.540	.282	0.119	0.105	1130
3/8"	.675	.403	0.126	0.146	920
1/2"	.840	.526	0.147	0.213	850
3/4"	1.050	.722	0.154	0.289	690

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-16 Originating SWC/AWC AWC-02

Equipment ID No. _____ Equip. Class _____

Equipment Description _____

Location: Bldg. CB Floor El. 15'-0" Room, Area *SWITCHGEAR ROOM*

Condition

Observed a crack passing through a bolt for a conduit support supporting conduits coming out of Relay Box TR-2 K00 on the north wall. Photos attached in AWC-02.

Documents Reviewed

EPRI NP-5228-SL, Revision 1, Volume 1,"Seismic Verification of Nuclear Plant Equipment Anchorage" Volume 1: Development of Anchorage Guidelines

Licensing Basis

Expansion anchor design has a safety factor of 4.

Evaluation

Based on SQUG criteria per EPRI NP-5228-SL, Revision 1, Volume 1, Table 2.16, where the crack width is between 10 mills and 20 mills, a factor of safety of 4 is adequate for fastener integrity. It is judged that the crack under observation falls into this width range and since plant procedure is to design to a safety factor of 4, the condition is determined to be acceptable. The crack width of this size has been accounted for by a safety factor of 4.

Conclusion Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 11-7-2012
Licensing Basis Reviewer

Reviewed by: Date 11/7/2012
Peer Reviewer

ATTACHMENT 9.9 LICENSING BASIS EVALUATION FORMS AND INSTRUCTIONS

Sheet 1 of 5

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-17 Originating SWC/AWC AWC-12

Equipment ID No. _____ Equip. Class _____

Equipment Description _____

Location: Bldg. AB Floor El. 18'-6" Room, Area *ABFP Room*

Condition

PWR-599 has only 4 anchor bolts instead of 6 as designed.

Documents Reviewed

Calculation IP3-DBD-322-7.2.5

Licensing Basis

For expansion anchor bolt, tension shear interaction must be less than 1.0.

Evaluation

With 4 bolts, the stress interaction is still less than 1.0.

Conclusion Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo KC Date 11-8-2012
Licensing Basis Reviewer

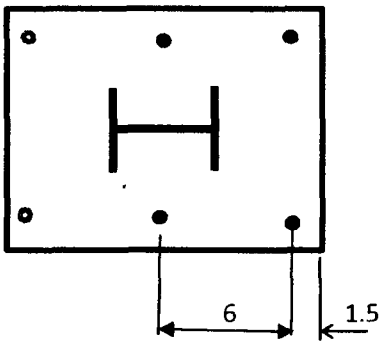
Reviewed by: CHIMAN PATEL Date 11-8-2012
Peer Reviewer

AWC- 12

PWR-599 has only 4 anchor bolts instead of 6

Per calculation IP3-DBD-322-7.2.5, p. 38 thru 40,
The horizontal pipe whip force will have the following loads:

V = shear =	3.9	kip
M = moment from cantilever length of 35" =	136.5	in-kip



Attachment is W6x12

t = plate thickness =	1.0	inch
b = width of plate =	12.0	inch
T1 = tension per bolt = $136.5(7.5)/[2(7.5^2 + 1.5^2)]$ =	8.75	kip
T2 = tension per bolt = $136.5(1.5)/[2(7.5^2 + 1.5^2)]$ =	1.75	kip
V = shear per bolt = V/4 =	0.98	kip

For 1" HK bolt with 6" emb in 4000psi concrete:
For pipe whip restraint, a safety factor of 2.0 can be used

Tu = ultimate tensile load =	20.52	kip
Vu = ultimate shear load =	27.12	kip
Ta = 0.5Tu =	10.26	kip
Va = 0.5Vu =	13.56	kip
T/Ta + V/Va =	0.925	< 1.0, o.k.

Check bending stress at plate

C = total compression = 2(T1 + T2) =	21.0	kip	
fb = bending stress = $6[21(1.5)]/[12(1)^2]$ =	15.75	ksi < 1.33(0.75Fy) =	35.91

Stress interaction at Hilti bolt and plate stress are below the acceptable limit.

FORM 5015

GENERAL COMPUTATION SHEET

united engineers & constructors inc.

J. O. NO. 9321-05

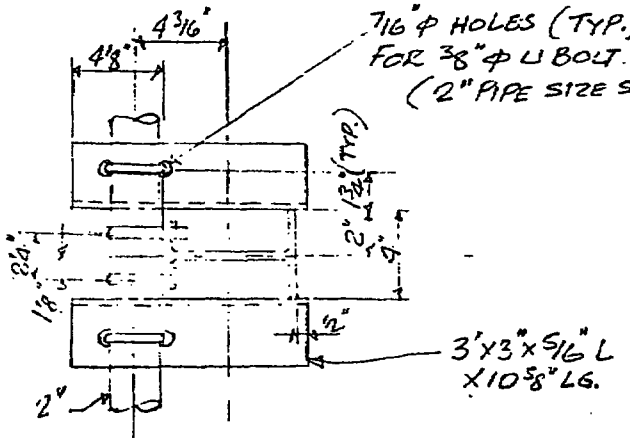
NAME OF COMPANY CON. ED. CO. OF N.Y. IPP #3 SHEET NO. 38 OF 161

DATE

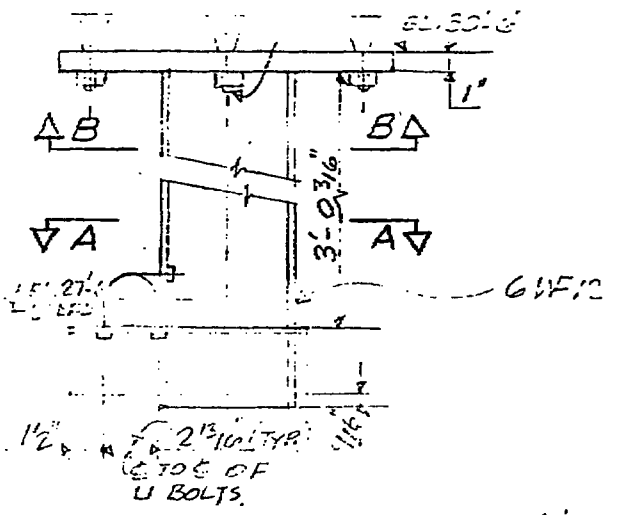
SUBJECT PIPE WHIP RESTRAINTS COMP. BY NGB C'K'D BY SK

PWR-567 (PWR's- 540, 572, 573, 586, 598, 599 & 600 ARE ALL SIMILAR.

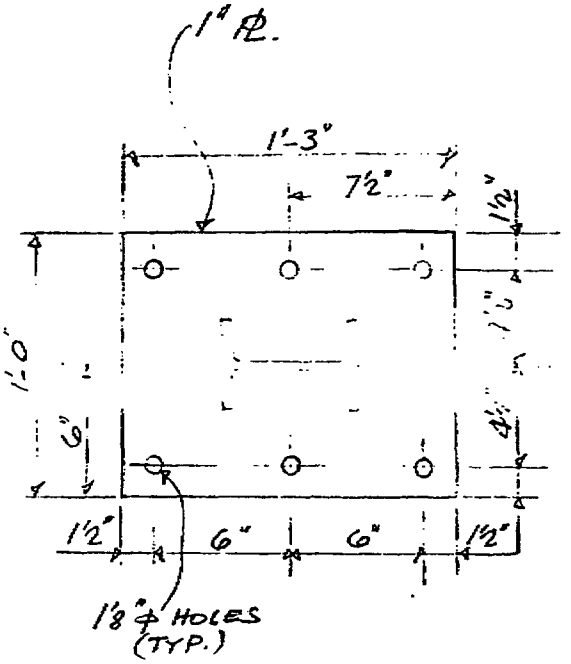
REF. DWG. F-21263



PLAN A-A



ELEVATION



SECTION B-B

NOTE: ALL WELDS TO BE 3/16" F.W. ALL ROUND

LOAD = 3.9K (ANY DIRECTION)

FORM 5016

united engineers & constructors inc.

NAME OF COMPANY

J. O. NO.

SHEET NO. 39 OF 161

DATE

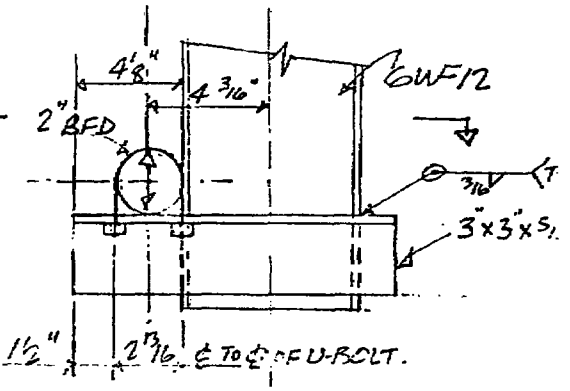
SUBJECT

COMP. BY C'K'D BY

PNR – 567

LOAD = 3.9 K

CONSIDERING ONE U-BOLT (3/8" ϕ)
SUPPORT AT 3"x3"x5/16"L ONLY.
S = .707 IN³



ELEVATION

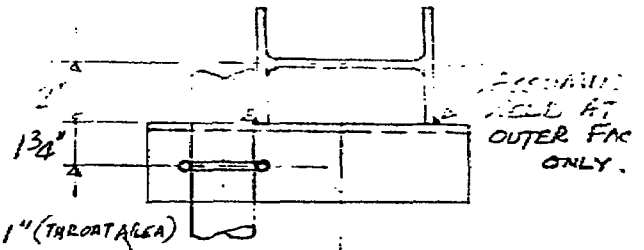
FOR DOWNWARD LOADING

CHECK 3"x3"x5/16"L FOR

$f_{SHEAR} = \frac{3.9}{3 \times .3125} = 4.16^{KSI}$ (O.K.)

$f_b = \frac{3.9}{.707} = 5.52^{KSI}$ (O.K.)

M = 3.9 x 1
= 3.9"K



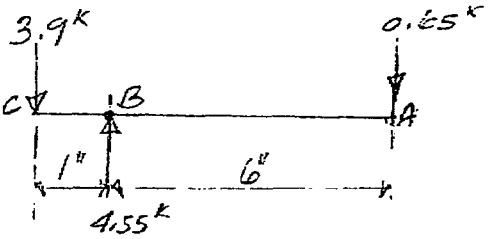
CHECK WELD FOR @ "B"

(ASSUME 1" (THROAT AREA) LINE WELD)

SHEAR STRESS.

$f_v = \frac{4.55}{3 \times 1} = 1.52^{K/IN}$

PLAN



WELD SIZE REQD.

$= \frac{1.52}{21 \times 1.5 \times .707} = 0.069" < .1875"$

3/16" F. WELD (O.K.)

$3.9 \times 7 = R_B \times 6$

$R_B = \frac{3.9 \times 7}{6} = 4.55^K$

$R_A = \frac{4.55 \times 1}{7} = 0.65^K$

PWR - 567

FOR UPWARD LOADING (3.9^K)

3/8"ϕ BOLT

ROOT AREA = 0.06 IN^2

CHECK U-BOLT (3/8"ϕ)

LOAD PER LEG OF BOLT $= \frac{3.9}{2} = 1.95^K$

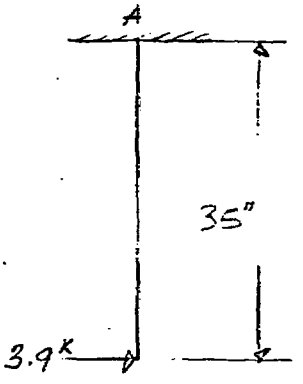
$f_{ta} = \frac{1.95}{0.068} = 28.68$ KSI (O.K.)

FROM U'BOLT TABLES, LOAD TAKEN BY 1 SET OF BOLT $= 1.65 + 0.38 = 2.03 \geq 1.95$

CHECK 6WF12

$t_w = .230$ IN^2 $S_x = 7.25$ IN^3

EL. 30'-6"
- 27'-6"
- 0'-1"
2'-11"



$f_b = \frac{136.5}{7.25} = 18.83$ KSI (O.K.)

$f_{SHEAR} = \frac{3.9}{6 \times .230} = 2.83$ KSI (O.K.)

CHECK WELD (3/16" F.W.)

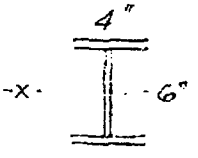
(ASSUME 1" LINE OF WELD)

$M_A = 3.9 \times 35 = 136.5"K$

$f_b = \frac{136.5}{54} = 2.53^K/IN$

$f_v = \frac{3.9}{2(6)} = 0.33^K/IN$

$f_R = \sqrt{(2.53)^2 + (.33)^2} = 2.55^K/IN$



$S_x = 2 \times 4 \times 6 + \frac{6^2}{6}$

$= 54$ IN^2

REQ'D. SIZE OF WELD $= \frac{2.55}{21 \times 1.5 \times .707}$

$= 0.115" \angle .1875"$

3/16" F.W. (O.K.)
(ALL ROUND)

$\frac{S}{(BOLT)} = \frac{2 \times 2 \times 6^2}{6} = 24$ IN^2

$M = 136.5"K$

CHECK BOLTS (6-1"ϕ)

TENSION FORCE/BOLT $= \frac{136.5}{24} = 5.69^K$ (O.K.) $\angle$ ALL. $23.186^K \times .5$ FROM TABLE

ATTACHMENT 9.9 **LICENSING BASIS EVALUATION FORMS AND INSTRUCTIONS**

Sheet 1 of 3

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-18 Originating SWC/AWC AWC-12

Equipment ID No. _____ Equip. Class _____

Equipment Description _____

Location: Bldg. AB Floor El. 18'-6" Room, Area *ABFP Room*

Condition

1" FP sprinkler pipe is 1"(+/-) away from a conduit.

Documents Reviewed

Licensing Basis

Adverse seismic interaction between two SSCs.

Evaluation

The combined seismic displacement of the FP pipe and conduit is less than 1" (+/-) provided.

Conclusion Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 11-8-2012
Licensing Basis Reviewer

Reviewed by: Chiman Patel Date 11-9-2012
Peer Reviewer

1" (1.315" OD) FP sprinkler pipe has a 1"+/- from a 1" conduit

Conservatively treat a 2 feet long, 1" pipe with a lump mass (15 feet of 1" pipe)

D = pipe outside diameter =	**1.315**	inch		
t = wall thickness for sch 40 pipe =	**0.133**	inch		
I = moment of inertia of 1" Sch 40 pipe =	**0.0874**	in^4		
w = uniform weight of pipe and water =	**2.173**	plf =	0.1811	#/in
m = lump mass of 15' of pipe =	32.6	lb use	**35**	
L = cantilever length =	**24**	in		

Based on shield wall EL. 41', 0.5% damping response spectra

Gh = horizontal seismic acceleration =	**0.64**			
MRM = multi-modal respone multiplier =	**2.0**			
E = modulus of elasticity =	**29000000**			
d1 = seismic deisplacement due to lump mass = $MRM(Gh)mL^3/(3EI)$ =			0.081	inch
d2 = seismic deisplacement due to self weight = $MRM(Gh)wL^4/(8EI)$ =			0.0038	inch
d_{pipe} = total seismic displacement of the FP pipe = d1 + d2 =	0.09	inch		

Determine the displacement of the 1" conduit

D = conduit outside diameter =	**1.315**	inch		
d = conduit inside diameter =	**1.063**	inch		
I = moment of inertia of 1" conduit = $0.0491[D^4-d^4]$ =	**0.0841**	in^4		
w = uniform weight of conduit and cable =	**2.09**	plf =	0.1742	#/in
m = lump mass of 20' of conduit =	41.8	lb use	**45**	

Case 1: a conduit with a cantilever of 12" and 20' of conduit mass

L = cantilever length =	**12**	in		
d1 = seismic deisplacement due to lump mass = $MRM(Gh)mL^3/(3EI)$ =			0.0136	inch
d2 = seismic deisplacement due to self weight = $MRM(Gh)wL^4/(8EI)$ =			0.0002	inch
d_c = total seismic displacement of the conduit = d1 + d2 =	0.0138	inch		

Case 2: conduit with a 8 feet span fixed-fixed condition

L =	**96**	in
d_c = seismic displacement of conduit = $wL^4/(384EI)$ =	0.016	in

The combined displacement of FP pipe and conduit = $d_{pipe} + d_c$ = 0.101 in

The combined seismic displacement of 0.101" is very small, less than 1" provided.

ATTACHMENT 9.9 **LICENSING BASIS EVALUATION FORMS AND INSTRUCTIONS**

Sheet 1 of 3

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-19 Originating SWC/AWC AWC-25

Equipment ID No. _____ Equip. Class _____

Equipment Description _____

Location: Bldg. PAB Floor El. 73'-0 Room, Area _____

Condition

Electric heat tracing cabinet support adjacent to the Boric Acid Batch Tank has corroded anchorage.

Documents Reviewed

Cannot locate the calculation for the existing support.

Licensing Basis

The safety related SSC must be designed seismically to maintain its function and for seismic interaction. For expansion anchor bolt, tension shear interaction must be less than 1.0.

Evaluation

The corroded anchorage is structurally adequate.
The new evaluation is on the next page.

Conclusion Condition Meets the Licensing Basis: ☒ Yes ☐ No

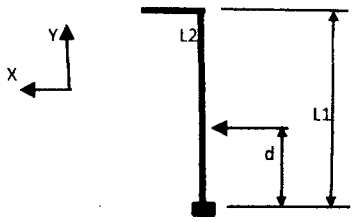
Prepared by: Kai Lo Date 11-9-2012
Licensing Basis Reviewer

Reviewed by: CHIMAN PATEL /Chiman Patel Date 11-9-2012
Peer Reviewer

AWC- 25

Corroded anchorage at the base of Electric Heat Tracing Cabinet

L1 = cantilever length from center of cabinet to floor =	51	inch, measured
L2 = length from center of cabinet to Unistrut post = 12"/2 =	6	inch, measured
W1 = weight of cabinet 18"hx24"wx12"d =	50	lb estimated
W2 = weight of content inside cabinet =	50	lb assumed
d = distance between the weld at stair and the floor =	20	inch
w = total weight = W1+w2 =	100	lb



For PAB EL. 73', peak G from 2% damping response spectra is used because of bolted structure

MRM =	1.5
Gh =	0.54
Gv = (2/3)Gh =	0.36

Assuming each post will take half the applied loads

Mz = applied overturning moment = 0.5{MRM(W)(Gh)W(L1) + W[1 + MRM(Gv)](L2)} =	2528	in-lb
Mx = applied overturning moment = 0.5{MRM(W)(Gh)W(L1) + W[1 + MRM(Gv)](L2)} =	2528	in-lb

My will be resolved as a force couple acting at the cantilever end

l = distance between the two post =	20	inch
Fx = couple formed by My = [MRM(Gh)(W)L2]/l =	24.3	lb
Mz' = Fx(L1) =	1239.3	in-lb

The moments will be transformed into a force couple because of the weld at the staircase.

There are two bolts at each base of the post

Vx = shear at the bolt = (Mz + Mz')/(2d) =	94	lb
Vz = shear at the bolt = (Mx)/(2d) =	63	lb
Vr = SRSS(Vx, Vz) =	113	lb
T = max tension per bolt = 0.5W[1 - MRM(Gv)]/2 =	11.5	lb

The bolts are 1/2" Hilti bolts

Assume the corroded bolt as 1/4" Hilti Kwik Bolt

Ta = allowable tension =	307.5	lb
Va = allowable shear =	400	lb
interaction = T/Ta + V/Va =	0.321	< 1.0, o.k.

The corroded bolts is still structurally adequate.

ATTACHMENT 9.9 LICENSING BASIS EVALUATION FORMS AND INSTRUCTIONS
Sheet 1 of 3

Licensing Basis (LB) Evaluation Form

LB Evaluation No. LB-20 Originating SWC/AWC SWEL1-045

Equipment ID No. _____ Equip. Class _____

Equipment Description _____

Location: Bldg. PAB Floor El. 41'-0 Room, Area _____

Condition

Some of the anchor bolts on thePAB Supply Fan are corroded, more than surface corrosion.

Documents Reviewed

Calculation IP3-CALC-PABHV-02203

Licensing Basis

The safety related SSC must be designed seismically to maintain its function.
For expansion anchor bolt, the safety factor for design condition is 4.

Evaluation

The corroded expansion anchors are structurally adequate, stress interaction is less than 1 based on SF=4.0
The new evaluation is on the next page.

Conclusion Condition Meets the Licensing Basis: ☒ Yes ☐ No

Prepared by: Kai Lo Date 11-9-2012
Licensing Basis Reviewer

Reviewed by: Dan Nuta Date 11-9-2012
Peer Reviewer

SWEL1- 45

The Hilit-Kwik bolts at the wall side have corrosion

Ref. 1, Calculation IP3-CALC-PABHV-02202, 1% damping and multi-modal response multiplier of 1.5 was used. Since a fan has many bolted parts, and the fan's frame is bolted to the isolator, thus most of the energy is dissipated in the bolts, the 2.5% damping can be used per UFSAR for bolted structure.

For PAB EL. 41', for 2% damping, using peak peak of response spectra

Gh2% = horizontal seismic acceleration = 0.4

For 2.5% damping, $G_{h2.5\%} = G_{h2\%}[2\%/2.5\%]^{0.5}$ = 0.358

Ref. EPRI TR-102180,"Guidelines for Estimation of Equipment Natural Frequency", Sect. 2.2

Natural frequency is usually higher than 8 Hz in the horizontal direction,

horizontal MRM = multi-modal response multiplier = 1.0

horizontal $MRM(G_{h2.5\%})$ = 0.358

Ref. 1 page 2, Ah = 0.8, so load ratio = $MRM(G_{h2.5\%})/Ah$ = 0.4472 horizontal direction

In the vertical direction, use MRM = 1.5 due to < 8Hz frequency

$G_{v2.5\%} = (2/3)G_{h2.5\%}$ = 0.2385

vertical $MRM(G_{v2.5\%})$ = 0.358

Ref. 1, page 2, Av = 0.53, so load ratio = $MRM(G_{v2.5\%})/Av$ = 0.6750 vertical direction

Ref. 1 page 8, bolt F has the highest tension of 633# due to seismic and dead weight of 281#.:

For 1% damping,

Due to horizontal seismic event in X direction, Tx = 502 lb

Due to horizontal seismic event in Z direction, Tz = 355 lb

Due to vertical seismic event in Y direction, Ty = 149 lb

Due to 2.5% damping,

Tx = 502(0.4472) = 225 lb

Tz = 355(0.4472) = 159 lb

Ty = 149(0.675) = 101 lb

Tr = SRSS(Tx,Ty,Tz) = 293 lb

For DW + 2.5% damping seismic loading:

Tdw = 281 lb

Tr - Tdw = 12 lb

Ref. 1 page 9, shear on bolt = 300 lb

Adjust the shear for 2.5% damping, shear at base plate = S = 0.4472(300#) = 134 lb

Ref. 1 page 10, at each bolt, tension and shear are:

$T/bolt = 1.2\{(12/3)^2 + [134x5.5/(2x3)]^2 + (134x5.5/8.375)^2\}^{0.5}$ = 181 lb

$S/bolt = [2(134/3)^2]^{0.5}$ = 63.2 lb

Conservatively considered the existing 3/8" bolts have corroded to 1/4"

Capacity of 1/4" HK bolt :

Ta = 1230/4 = 307.5 lb

Sa = 400 lb

interaction = T/Ta + S/Sa = 0.75 < 1.0, o.k.

ATTACHMENT 9.10 **PEER REVIEW CHECKLIST FOR SWEL FORM**

Sheet 1 of 4

Peer Review Checklist for SWEL

Instructions for Completing Checklist

This peer review checklist may be used to document the review of the Seismic Walkdown Equipment List (SWEL) in accordance with EPRI 1025286, Section 6: Peer Review. The space below each question in this checklist should be used to describe any findings identified during the peer review process and how the SWEL may have changed to address those findings. Additional space is provided at the end of this checklist for documenting other comments.

1. Were the five safety functions adequately represented in the SWEL 1 selection? Y☒ N☐
   All five safety functions were adequately represented in SWEL-1

2. Does SWEL 1 include an appropriate representation of items having the following sample selection attributes:

   a. Various types of systems? Y☒ N☐
      Various types of systems such as mechanical, electrical, control units etc. were considered

   b. Major new and replacement equipment? Y☒ N☐
      New/replacement equipment were represented (thermostats, solenoid valves, breakers etc. see Base List 1)

   c. Various types of equipment? Y☒ N☐
      Various types of equipment were represented on the SWEL-1, such as pumps, valves, fans, circuit breakers, electrical cabinets, MCC's, switchgears, etc.

ATTACHMENT 9.10 **PEER REVIEW CHECKLIST FOR SWEL FORM**

Sheet 2 of 4

Peer Review Checklist for SWEL

d. Various environments? Y☒ N☐

Various environments were considered.

e. Equipment enhanced based on the findings of the IPEEE (or equivalent) program? Y☒ N☐

Yes, in particular, the EDG room CO2 system was identified as a seismic vulnerability under the IPEEE program. A modification was subsequently installed. The new installation of CO2 fire suppression system 1A, 1B, 1C for Diesel Generator Rooms 31, 32, and 33 are described under Section 3.29.2, pp. 3-48 thru 3-51 of IP3-DBD-321, Rev.4.

f. Were risk insights considered in the development of SWEL 1? Y☒ N☐

Yes, risk insights were considered in the development of SWEL-1

3. For SWEL 2:

a. Were spent fuel pool related items considered, and if applicable included in SWEL 2? Y☒ N☐

b. Was an appropriate justification documented for spent fuel pool related items not included in SWEL 2? Y☒ N☐

Yes, as shown in Table 4, Attachment B

ATTACHMENT 9.10 **PEER REVIEW CHECKLIST FOR SWEL FORM**

Sheet 3 of 4

Peer Review Checklist for SWEL

4. Provide any other comments (Attachment 9.11) related to the peer review of the SWELs.

   The development of SWEL-1 and SWEL-2 was conducted in satisfaction of the EPRI guidance.

5. Have all peer review comments been adequately addressed in the final SWEL? Y☒ N☐

Peer Reviewer #1: *Tom Panayotidi* _____ Date: *11/07/2012*

Peer Reviewer #2: *Kenneth Whitmore* _____ for Kenneth Whitmore Date: *11/07/2012*

Peer Review Checklist for SWEL Instructions

The following instructions are meant to aid in completing the form and a guideline pertaining to the type and amount of information that is to be placed in each section of the checklist.

For all items in the checklist, identify whether the action has been completed and provide comments and/or discussions with the Seismic Walkdown Team that can be considered applicable to answer the item in the checklist.

NOTE
Add additional SWEL Peer Reviewers to the Peer Review Checklist form as required

Peer Reviewer #1: -The SWEL Peer Reviewer shall print and sign their name and include the date that the review was complete.

Peer Reviewer #2: -The SWEL Peer Reviewer shall print and sign their name and include the date that the review was complete.

ATTACHMENT H – REVIEW COMMENTS AND RESOLUTIONS FORM

ATTACHMENT 9.11 **PEER REVIEW COMMENT FORM**

Sheet 1 of 1

Entergy

Seismic Walkdown Submittal Report
Review Comments and Resolutions Form

Engineering Report Number	IP-RPT-12-00039	Rev. 0	Title: Indian Point Energy Center, Unit 3 Seismic Walkdown Report for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic
Quality Related: ☐ Yes ☒ No		**Special Notes or Instructions:** N/A	

Comment Number	Section/Page No.	Review Comment	Response/Resolution	Reviewer's Accept Initials
1	SWEL1-013	Q.2, Q.3: provide a statement on the condition of the anchorage. Provide the name of the SWE's on pg. 3	Condition cannot be ascertained since it is inside of the cabinet and the cabinet cannot be opened except during an outage. SWEs are noted on page 3.	P.P.
2	SWEL1-016	Q.2, Q.3: provide a statement on the condition of the anchorage.	Condition cannot be ascertained since it is inside of the cabinet and the cabinet cannot be opened except during an outage.	P.P
3	SWEL1-022	Q.2, Q.3, Q.4: provide a statement on the condition of the anchorage.	Statement on the condition of the anchorage has been added.	P.P
4	SWEL1-030	Q.2, Q.3, Q.4: provide a statement on the condition of the anchorage.	Statement on the condition of the anchorage has been added.	P.P
5	SWEL1-019	Q.2, Q.3, Q.4: provide a statement on the condition of the anchorage.	Statement on the condition of the anchorage has been added.	P.P
6	SWEL1-031, SWEL1-034, SWEL1-035, SWEL1-040, SWEL1-048, SWEL1-054, SWEL1-055, and SWEL1-056	Q.2 Q.3 *and* Q4: provide a statement on the condition of the anchorage. Provide the name of the SWE's on pg. 3	Statement on the condition of the anchorage has been added. SWEs are noted on page 3.	P.P.

Entergy

Seismic Walkdown Submittal Report
Review Comments and Resolutions Form

Engineering Report Number	IP-RPT-12-00039	Rev. 0	Title: Indian Point Energy Center, Unit 3 Seismic Walkdown Report for Resolution of Fukushima Near-Term Task Force Recommendation 2.3: Seismic
Quality Related: ☐ Yes ☒ No		**Special Notes or Instructions:** N/A	

Comment Number	Section/Page No.	Review Comment	Response/Resolution	Reviewer's Accept Initials
	AWC-01, AWC-03, AWC-07, AWC-08, and AWC-12.	SWEL component formatting is not consistent with En-DC-168. *It must be SWEL1-XXX* AWC format needs to be AWC-XXX.	SWEL and AWC sheets have been reviewed for consistency with formatting and revised as necessary.	P.P.

Reviewed By:	Pouria Pourghobadi	Date	11/14/2012	Resolved By:	Paul Huebsch
Site/Department:	IPEC/ENERCON	Ph.		Date: 11/14/2012	

ATTACHMENT I – SEISMIC WALKDOWN ENGINEER TRAINING CERTIFICATES

ENERCON

Excellence—Every project. Every day.

Certificate of Completion

is hereby granted to

Tom Panayotidi

for successful completion of

TRAINING ON NEAR TERM TASK FORCE RECOMMENDATION 2.3

PLANT SEISMIC WALKDOWNS

Awarded: 9/13/2012 in Mt. Arlington, NJ

Kevin Bessell
Certified Seismic Walkdown Engineer
Palo Alto, CA – 6/13/2012

Alex Smerch
Certified Seismic Walkdown Engineer
Palo Alto, CA – 6/13/2012

ENERCON

Excellence—Every project. Every day.

Certificate of Completion

is hereby granted to

Maggie Farah

for successful completion of

TRAINING ON NEAR TERM TASK FORCE RECOMMENDATION 2.3

PLANT SEISMIC WALKDOWNS

Awarded: 7/26/2012 in Mt. Arlington, NJ

Kenneth Whitmore
Certified Seismic Walkdown Engineer
Alexandria, VA – 6/20/2012

ATTACHMENT I – SEISMIC WALKDOWN ENGINEER TRAINING CERTIFICATES

ENERCON

Excellence—Every project. Every day.

Certificate of Completion

is hereby granted to

Paul Huebsch

for successful completion of

TRAINING ON NEAR TERM TASK FORCE RECOMMENDATION 2.3

PLANT SEISMIC WALKDOWNS

Awarded: 9/13/2012 in Mt. Arlington, NJ

Kevin Bessell
Certified Seismic Walkdown Engineer
Palo Alto, CA – 6/13/2012

Alex Smerch
Certified Seismic Walkdown Engineer
Palo Alto, CA – 6/13/2012

ENERCON

Excellence—Every project. Every day.

Certificate of Completion

is hereby granted to

Steve Yuan

for successful completion of

TRAINING ON NEAR TERM TASK FORCE RECOMMENDATION 2.3

PLANT SEISMIC WALKDOWNS

Awarded: 7/26/2012 in Mt. Arlington, NJ

Kenneth Whitmore
Certified Seismic Walkdown Engineer
Alexandria, VA – 6/20/2012

ATTACHMENT I – SEISMIC WALKDOWN ENGINEER TRAINING CERTIFICATES

ENERCON

Excellence—Every project. Every day.

Certificate of Completion

is hereby granted to

Pouria Pourghobadi

for successful completion of

TRAINING ON NEAR TERM TASK FORCE RECOMMENDATION 2.3

PLANT SEISMIC WALKDOWNS

Awarded: 9/13/2012 in Mt. Arlington, NJ

Kevin Bessell
Certified Seismic Walkdown Engineer
Palo Alto, CA – 6/13/2012

Alex Smerch
Certified Seismic Walkdown Engineer
Palo Alto, CA – 6/13/2012

EPRI

Certificate of Completion

Kenneth Whitmore

Training on Near Term Task Force Recommendation 2.3 - Plant Seismic Walkdowns

June 21, 2012
Date

R.P. Kassawara
Robert K. Kassawara
EPRI Manager,
Structural Reliability & Integrity

EPRI

Certificate of Completion

Richard Drake

Training on Near Term Task Force Recommendation 2.3 - Plant Seismic Walkdowns

July 19, 2012
Date

R.P. Kassawara
Robert K. Kassawara
EPRI Manager,
Structural Reliability & Integrity

SQUG

Certificate of Achievement

This is to Certify that

Kai K. Lo

has Completed the SQUG Walkdown Screening and Seismic Evaluation Training Course Held August 2-6, 1993

David A. Freed, MPR Associates
SQUG Training Coordinator

Neil P. Smith, Commonwealth Edison
SQUG Chairman

Robert P. Kassawara, EPRI
SQUG Program Manager

SQUG

CERTIFICATE OF ACHIEVEMENT

THIS IS TO CERTIFY THAT

Dragos A. Nuta

HAS COMPLETED THE SQUG WALKDOWN SCREENING AND SEISMIC EVALUATION TRAINING COURSE
AUGUST 16, 2001

Paul D. Baughman, EQE International
SQUG Instructor

Richard G. Starck, MPR Associates
SQUG Training Coordinator

John M. Richards, Duke Energy
SQUG Chairman

Robert P. Kassawara, EPRI
SQUG Program Manager

ATTACHMENT I – SEISMIC WALKDOWN ENGINEER TRAINING CERTIFICATES

ENERCON

Excellence—Every project. Every day.

Certificate of Completion

is hereby granted to

Nicholas Crispell

for successful completion of

TRAINING ON NEAR TERM TASK FORCE RECOMMENDATION 2.3

PLANT SEISMIC WALKDOWNS

Awarded: 9/13/2012 in Mt. Arlington, NJ

Kevin Bessell
Certified Seismic Walkdown Engineer
Palo Alto, CA – 6/13/2012

Alex Smerch
Certified Seismic Walkdown Engineer
Palo Alto, CA – 6/13/2012

ATTACHMENT J - SEISMIC WALKDOWN CHECKLISTS (SWCs)

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-007

Equipment ID No. *34MCC* Equip. Class[1] *1*

Equipment Description *TURBINE GENERATOR BUILDING MOTOR CONTROL CENTER 34*

Location: Bldg. *TB* Floor El. *15'-0"* Room, Area

Manufacturer, Model, Etc. (optional but recommended)

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1. Is the anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)? Y☐ N☒

   The anchorage is not part of the 50% of SWEL items requiring verification.

2. Is the anchorage free of bent, broken, missing or loose hardware? Y☒ N☐ U☐ N/A☐

   MCC cabinet doors and panels were opened to examine the anchorage.

3. Is the anchorage free of corrosion that is more than mild surface oxidation? Y☒ N☐ U☐ N/A☐

   MCC cabinet doors and panels were opened to examine the anchorage. R1

4. Is the anchorage free of visible cracks in the concrete near the anchors? Y☒ N☐ U☐ N/A☐

   MCC cabinet doors and panels were opened to examine the anchorage. No visible crack on the coating on the concrete pad.

[1] Enter the equipment class name from EPRI 1025286, Appendix B: Classes of Equipment.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-007

Equipment ID No. *34MCC* Equip. Class[1] *1*

Equipment Description *TURBINE GENERATOR BUILDING MOTOR CONTROL CENTER 34*

5. Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.) Y☐ N☐ U☐ N/A☒

   Not applicable since the anchorage configuration verification is not required.

6. Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions? Y☒ N☐ U☐ R1

   MCC cabinet doors and panels were opened to examine the anchorage.

Interaction Effects

7. Are soft targets free from impact by nearby equipment or structures? Y☐ N☒ U☐ N/A☐

   A hood above the cabinet is resting on a water pipe. The original supports are no longer there. At the opposite end, the hood is supported on chains to an upper elevation. SQUG indicated that the hood is adequately supported. It does not appear to be adequately supported at this time. This has been addressed in CR-IP3-2012-03656.

8. Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment? Y☐ N☒ U☐ N/A☐

   Piping above and adjacent to the cabinet does not appear to be seismically supported. This includes both water and fire water lines. This has been addressed in CR-IP3-2012-03656.

9. Do attached lines have adequate flexibility to avoid damage? Y☒ N☐ U☐ N/A☐

   Attached lines have adequate flexibility to avoid damage.

10. Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects? Y☐ N☒ U☐

    Equipment is not free of adverse seismic interaction effects.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-007

Equipment ID No. *34MCC* Equip. Class[1] *1*

Equipment Description *TURBINE GENERATOR BUILDING MOTOR CONTROL CENTER 34*

Other Adverse Conditions

11. Have you looked for and found no other seismic conditions that could adversely affect the safety functions of the equipment? Y☒ N☐ U☐

Yes, we have looked for and found no other seismic conditions that could adversely affect the safety functions of the equipment.

Comments (Additional pages may be added as necessary) R1

The top and bottom panels, vertical wirways and one cubicle 5H were opened and inspected. The lower portion of the North face vertical panel is bulging out (see photo) but this is acceptable because it is not structurally significant. Some dust and debris were found when the bottom panels were opened. There are no adverse seismic conditions.

References:
SK-018 R0 MCC-34, Turbine Building El 15'-0" Civil/Structural
9321-F-10323-5 Turbine Building Concrete Plan at El 15'-0" S.E. Portion
9321-F-20063-28 Turbine Building and Heater Bay General Arrangement Ground Floor Plan at Elev 15'-0"
AWC-008

Evaluated by:

Dan Nuta Date: *2-15-13*

Kai Lo Date: *2-15-13*

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-007

Equipment ID No. *34MCC* Equip. Class[1] *1*

Equipment Description *TURBINE GENERATOR BUILDING MOTOR CONTROL CENTER 34*

Photographs

Note:

34MCC

R1

Note:

34MCC

Photographs

R1

Note:

Slight bulging at the lower part of the north panel.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-008

Equipment ID No. *31 MCC* Equip. Class[1] *1*

Equipment Description *INTAKE STRUCTURE MCC*

Location: Bldg. *IS* Floor El. *15'-0"* Room, Area

Manufacturer, Model, Etc. (optional but recommended)

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1. Is the anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)? Y☐ N☒

   No, the anchorage configuration verification is not required.

2. Is the anchorage free of bent, broken, missing or loose hardware? Y☒ N☐ U☐ N/A☐

   The top and bottom panels, vertical wireway panels were opened.

   R1

3. Is the anchorage free of corrosion that is more than mild surface oxidation? Y☒ N☐ U☐ N/A☐

   The top and bottom panels, vertical wireway panels were opened. Anchors are of the embedded rod type. All the anchors have mild surface corosion because of the outdoor humidity.

4. Is the anchorage free of visible cracks in the concrete near the anchors? Y☒ N☐ U☐ N/A☐

   Concrete pad beneath the MCC's base is in good condition. No visible cracks were observed.

[1] Enter the equipment class name from EPRI 1025286. Appendix B: Classes of Equipment.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-008

Equipment ID No. *31 MCC* Equip. Class[1] *1*

Equipment Description *INTAKE STRUCTURE MCC*

5. Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.) Y☐ N☐ U☐ N/A☒

   Not applicable since component is not part of the anchorage configuration verification.

6. Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions? Y☒ N☐ U☐ R1

Interaction Effects

7. Are soft targets free from impact by nearby equipment or structures? Y☒ N☐ U☐ N/A☐

   Yes, soft targets are free from impact by nearby equipment or structures.

8. Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment? Y☒ N☐ U☐ N/A☐

   Tray over the cabinet is supported on long rod hangers. The trays are probably not seismically supported but they are hightly damped. This is considered acceptable.

9. Do attached lines have adequate flexibility to avoid damage? Y☒ N☐ U☐ N/A☐

   Attached lines have adequate flexibility to avoid damage.

10. Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects? Y☒ N☐ U☐

    Equipment is free of adverse seismic interaction effects.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) **SWEL1-008**

Equipment ID No. *31 MCC* Equip. Class[1] *1*

Equipment Description *INTAKE STRUCTURE MCC*

Other Adverse Conditions

11. Have you looked for and found no other seismic conditions that could adversely affect the safety functions of the equipment? Y☒ N☐ U☐

Yes, we have looked for and found no other seismic conditions that could adversely affect the safety functions of the equipment.

Comments (Additional pages may be added as necessary)

The following conditions were observed and item 1 & 2 were reported in CR-IP3-2013-00675. WR-298807 was generated. None of the following items are seismically significant.

1. *A few of the screws near the edge of the East and West exterior panel are missing. A few missing screws will not affect the structural integrity of the MCC's frame, and there is no adverse seismic interaction.*
2. *The two bottom panels beneath cobicle 1M, 2M, 3M and 4M/4MC have no screws on them. There is no adverse seismic interaction because the panels can only be disloged and moved toward the exterior panel.* R1
3. *Housekeeping issue: Two loose padlocks were found on the ledge but were removed by the operator.*
4. *The West side exterior panel has mild surface corrosion.*
5. *The bottom ledge has mild surface corrosion.*
6. *All the anchor bolts have mild surface corrosion.*
7. *Inside the top panels, the contact screws have slight surface corrosion.*

References:
9321-F-20113-13 Intake Structure, General Arrangement, Plan
CR-IP3-2013-00618
AWC-009

Evaluated by:

Dan Nuta *2-14-13*

Kai Lo *2-14-13*

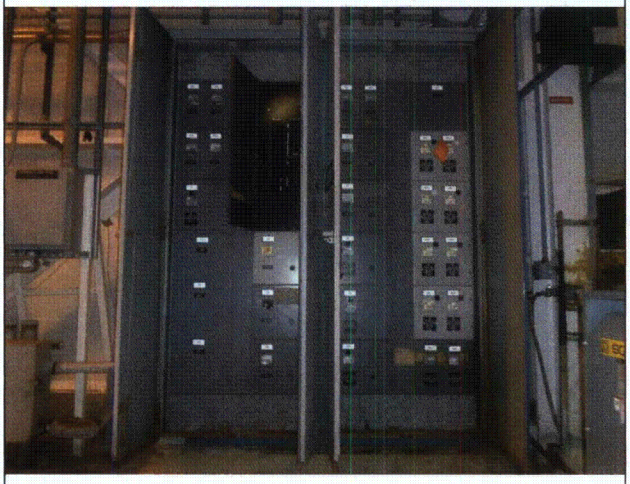
Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-008

Equipment ID No. *31 MCC* Equip. Class[1] *1*

Equipment Description *INTAKE STRUCTURE MCC*

Photographs



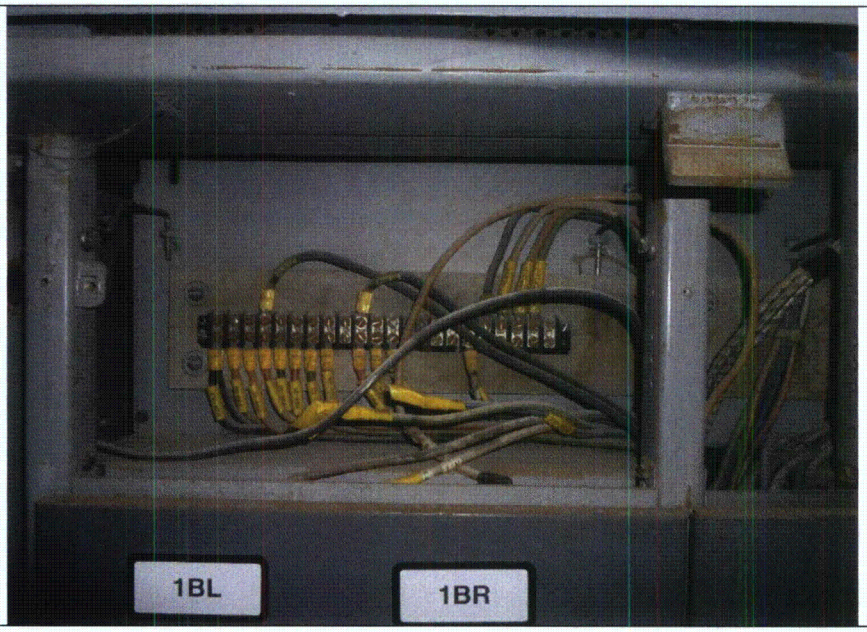
Note:

31 MCC door opened

R1

Note:

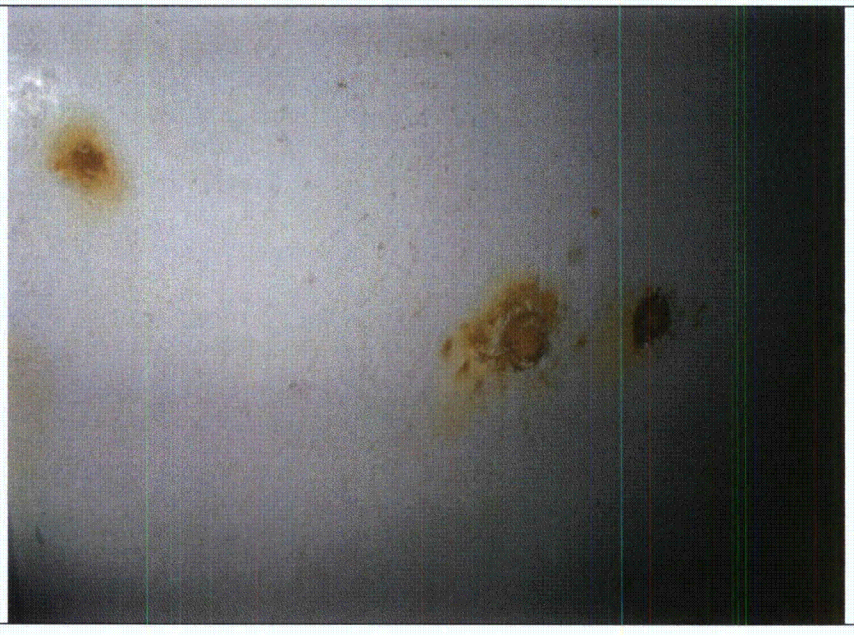
Bottom panel opened for inspection of anchorage. Mild surface corrosion was observed.



Note:

Top panel opened for inspection of internals. Mild surface corrosion was observed on screw heads.

R1



Note:

Mild surface corrosion was observed on screw heads and panel surface.

R1

Note:

Housekeeping issue: A pad lock was found inside the MCC at the base.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-009

Equipment ID No. *36BMCC* Equip. Class[1] *1*

Equipment Description *PAB MOTOR CONTROL CENTER 36B (36AMCC anchorage & interior was inspected, see page 3**)*

Location: Bldg. *PA* Floor El. *55'-0"* Room, Area

Manufacturer, Model, Etc. (optional but recommended)

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1. Is the anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)? Y☒ N☐

   Yes, check the anchorage.

2. Is the anchorage free of bent, broken, missing or loose hardware? Y☒ N☐ U☐ N/A☐

   Anchorage is inside of the cabinet and the doors cannot be opened except during an outage. 36AMCC was inspected in 3R17 because of the similiarity with 36BMCC and is less risk. Lower, upper panels and wire way were opened. The anchorage was inspected and is free of bent, broken, missing or loose hardware. R1

3. Is the anchorage free of corrosion that is more than mild surface oxidation? Y☒ N☐ U☐ N/A☐

   See answer to question 2. The anchorage is free of corrosion that is more than mild surface oxidation.

4. Is the anchorage free of visible cracks in the concrete near the anchors? Y☒ N☐ U☐ N/A☐

   See answer to question 2. The anchorage is free of visible cracks in the concrete near the anchors that are accesible by visual observation.

[1] Enter the equipment class name from EPRI 1025286. Appendix B: Classes of Equipment.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-009

Equipment ID No. *36BMCC* Equip. Class[1] *1*

Equipment Description *PAB MOTOR CONTROL CENTER 36B (36AMCC anchorage & interior was inspected, see page 3**)*

5. Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.) Y☒ N☐ U☐ N/A☐

   See answer to question 2. Anchorage is consistent with plant configuration.

6. Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions? Y☒ N☐ U☐ R1

   See answer to question 2. The anchorage is free of potentially adverse seismic conditions.

Interaction Effects

7. Are soft targets free from impact by nearby equipment or structures? Y☒ N☐ U☐ N/A☐

   Yes, soft targets are free from impact by nearby equipment or structures.

8. Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment? Y☒ N☐ U☐ N/A☐ R1

   Fluorescent bulbs do not need to be restrainted generically.

9. Do attached lines have adequate flexibility to avoid damage? Y☒ N☐ U☐ N/A☐

   Yes, attached lines have adequate flexibility to avoid damage.

10. Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects? Y☒ N☐ U☐ R1

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-009

Equipment ID No. *36BMCC* Equip. Class[1] *1*

Equipment Description *PAB MOTOR CONTROL CENTER 36B (36AMCC anchorage & interior was inspected, see page 3**)*

Other Adverse Conditions

11. Have you looked for and found no other seismic conditions that could adversely affect the safety functions of the equipment? Y☒ N☐ U☐

Yes, we have looked for and found no other seismic conditions that could adversely affect the safety functions of the equipment.

*** Both 36AMCC and 36BMCC were energized during 3R17. OPS allow the partial opening of 36BMCC cubicle doors because there will be less safety risk to the plant. Both MCC's structure are the same, i.e the anchorage and interior connections. The interior components are also very similar, providing similar function to the plant system. (ref. P1184-000-001 Rev. 2 Attachment 8, page 21 through 29)* R1

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-009

Equipment ID No. *36BMCC* Equip. Class[1] *1*

Equipment Description *PAB MOTOR CONTROL CENTER 36B (36AMCC anchorage & interior was inspected, see page 3**)*

Comments (Additional pages may be added as necessary)

CR-IP3-2013-01644 was generated.

The following condition were observed:

(1) Two carts near the HP desk by the entrance should have their wheels blocked/choked to prevent movement during a seismic event. These carts are not near safety related equipment currently but should have their wheels choked in accordance with IP-SMM-DC-910.

(2) Inside the compartment above cubicle 9RC, an inside partition panel (approximately 6" wide by 10" high) is missing two screws on the right side. This panel is held in place by one screw and one inserted tab on the left side. The inserted tab and the remaining screw on the panel are structurally capable to hold the panel in place during a seismic event because the panel is light. Though the partition panel is opened up with an observable gap, it cannot interact with anything nearby.

(3) The two exterior side panels of the MCC have missing screws. One top screw of a side panel is missing 1 out of 16 screws. For the other side panel, one bottom screw is missing out of 16. Even though there is one screw missing on each panel, the panel is judged to be supported adequately by the remaining 15 bolts during a seismic event because the weight of the panel is small when compared to the combined capacity of the 15 screws.

(4) The hinged vertical wire way exterior panel (on the south side of MCC) adjacent to cubicle 10FJ and 10FM is missing one of the two screws. The one remaining screw on the panel and the hinge are structurally capable to hold the panel in place during a seismic event because the panel is light.

(5) The hinged vertical wire way exterior panel (on the south side of MCC) adjacent to cubicle 10FC has one screw with a broken pin and can fall off. The hinge and the other remaining screw on the panel are structurally capable to hold the panel in place during a seismic event because the panel is light.

(6) In the bottom of the MCC, with the bottom panels removed, there are pieces of tie wraps, two fuses and tape lying inside. This is just a house keeping issue.

References:

Sk-020-0 Sh 1 of 2 MCC36B, PAB El 55'-0" Civil/Structural

SEWS Sheet 480 VAC MCC

9321-LL-67957 SH 1 & 2

9321-F-13123 Structural Supports for Extension of MCC 36A & 36B and Waste Disposal Panel @ EL. 55'-0 PAB

9321-F-70693-2 Primary Auxiliary Building General Arrangement, Plan at Elev 55'-0", Instrumentation

9321-F-25153-22 Primary Auxiliary Building General Arrangement, Plans at Elev 55'-0" and 73'-0"

CR-IP3-2013-01644

AWC-028

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-009

Equipment ID No. *36BMCC* Equip. Class[1] *1*

Equipment Description *PAB MOTOR CONTROL CENTER 36B (36AMCC anchorage & interior was inspected, see page 3**)*

Evaluated by: *Kai Lo* Date: *3/16/2013*

Dan Nuta Date: *3/16/2013*

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-009

Equipment ID No. *36BMCC* Equip. Class[1] *1*

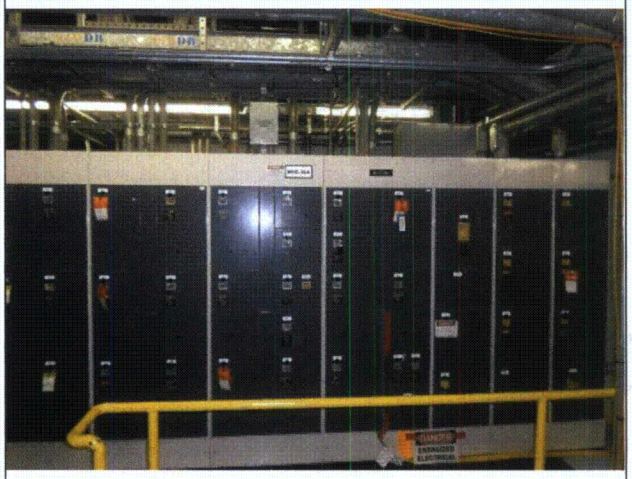
Equipment Description *PAB MOTOR CONTROL CENTER 36B (36AMCC anchorage & interior was inspected, see page 3**)*

Photographs

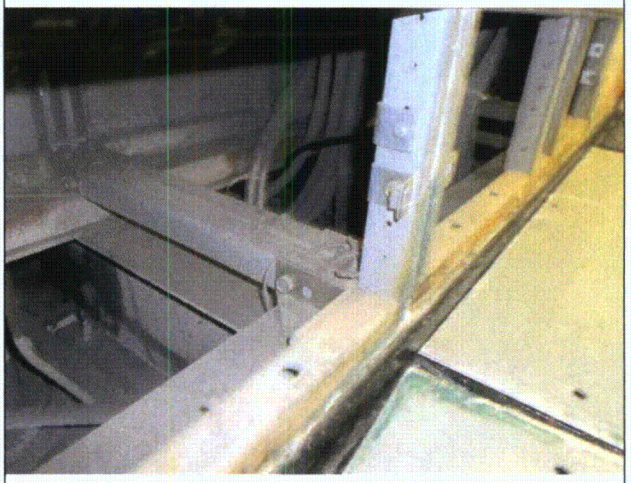
Note: *MCC36B Tag*

Note: *MCC36B was walkdown for interaction effect and area walkby only.*

Photographs

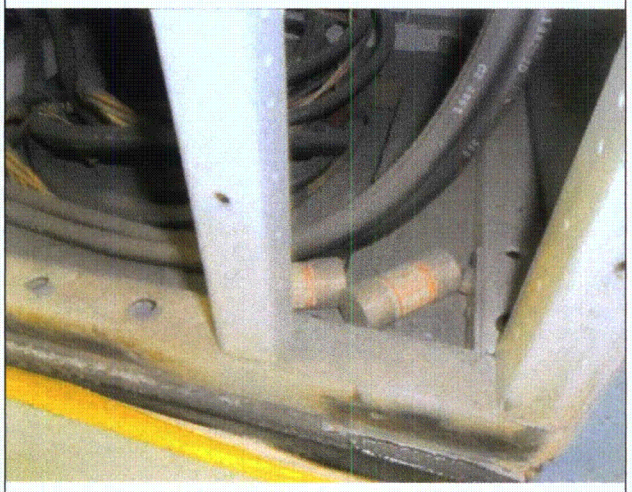


36AMCC anchorage and interior were inspected due to its similarity with 36BMCC



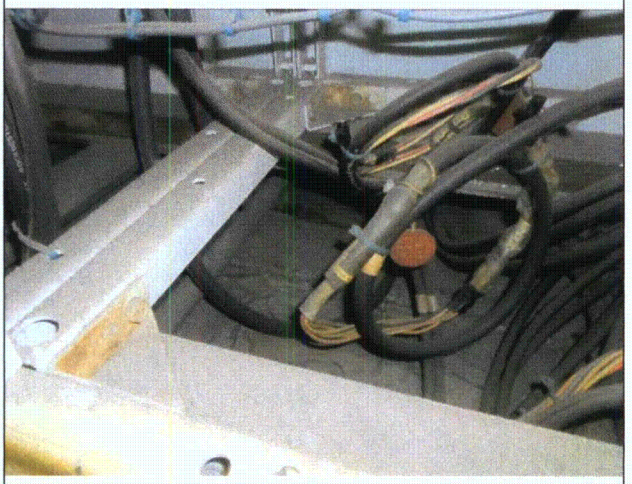
Typical view of anchorage

Photographs



Housekeeping issue

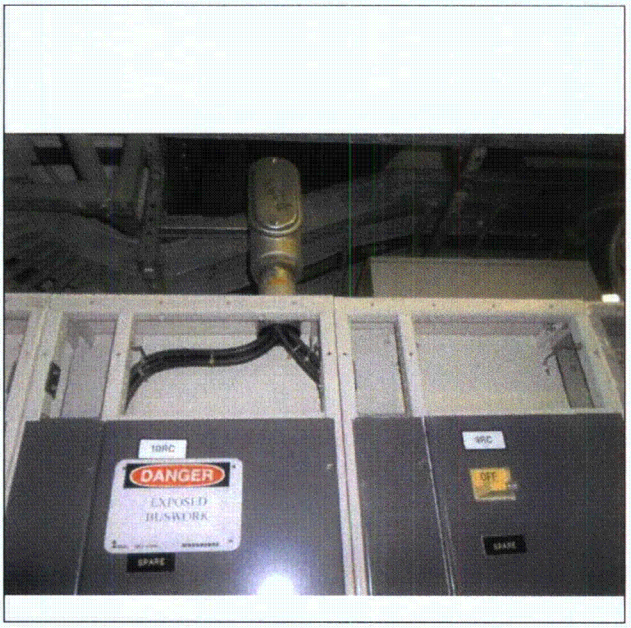
Fuse left inside the floor space



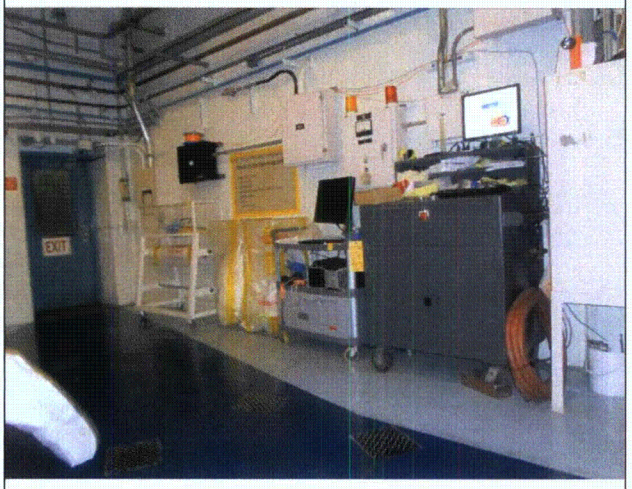
Housekeeping issue

Tie wraps left inside the floor space

Photographs



Photographs



Two carts by HP desks have wheels that are not blocked/choked

R1

Status: Y☒ N☐ U☐

Seismic Walkdown Checklist (SWC) SWEL1-010

Equipment ID No. *38MCC* Equip. Class[1] *1*

Equipment Description *CONTAINMENT MOTOR CONTROL CENTER 38*

Location: Bldg. *VC* Floor El. *68'-0"* Room, Area

Manufacturer, Model, Etc. (optional but recommended)

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1. Is the anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)? Y☐ N☒

   NOT PART OF ANCHOR CHECKS

2. Is the anchorage free of bent, broken, missing or loose hardware? Y☒ N☐ U☐ N/A☐

   The structural steel angles and Hilti bolts are free of bent, broken, missing or loose hardware.

3. Is the anchorage free of corrosion that is more than mild surface oxidation? Y☒ N☐ U☐ N/A☐

   The anchorage is free of corrosion that is more than mild surface oxidation.

4. Is the anchorage free of visible cracks in the concrete near the anchors? Y☒ N☐ U☐ N/A☐

   The anchorage is free of visible cracks in the concrete near the anchors.

[1] Enter the equipment class name from EPRI 1025286, Appendix B: Classes of Equipment.

Status: Y☒ N☐ U☐

Seismic Walkdown Checklist (SWC) SWEL1-010

Equipment ID No. *38MCC* Equip. Class[1] *1*

Equipment Description *CONTAINMENT MOTOR CONTROL CENTER 38*

5. Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.) Y☐ N☐ U☐ N/A☒

   This item is not one of the 50% for which anchorage configuration verification is required.

6. Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions? Y☒ N☐ U☐

Interaction Effects

7. Are soft targets free from impact by nearby equipment or structures? Y☒ N☐ U☐ N/A☐

   CR-IP3-2013-01635 was generated for the following and WO 345157 was scoped into 3R17:
   Observed a vertical unistrut projecting above MCC 38 that is touching a horizontal 2 1/2" diameter stainless steel pipe carrying demineralized water to the Fire Hose station located east of Rack 19. The unistrut supports no instrumentation over the last 6 inches of the projection above the MCC and this portion may be considered excess material that may be removed. The projecting unistrut should be shortened by 4" to 6", or a sufficient portion, in order to eliminate the possible interaction between the 2 1/2 " diameter pipe and MCC 38. The projecting unistrut was shortened during 3R17 to eliminate any possible interaction.

8. Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment? Y☒ N☐ U☐ N/A☐

   Overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls are not likely to collapse onto the equipment.

9. Do attached lines have adequate flexibility to avoid damage? Y☒ N☐ U☐ N/A☐

   Attached lines have adequate flexibility to avoid damage.

Status: Y☒ N☐ U☐

Seismic Walkdown Checklist (SWC) SWEL1-010

Equipment ID No. *38MCC* Equip. Class[1] *1*

Equipment Description *CONTAINMENT MOTOR CONTROL CENTER 38*

10. Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects? Y☒ N☐ U☐

There is a ¾" gap between the top of the MCC and the concrete wall. Licensing Basis evaluation LB-24 was generated to evaluate the ¾" gap and found it to be adequate.

Other Adverse Conditions

11. Have you looked for and found no other seismic conditions that could adversely affect the safety functions of the equipment? Y☒ N☐ U☐

Comments (Additional pages may be added as necessary)

The side panel of Rack 16 located near the outer containment wall has duct tape on one side of the panel because 5 out of the 10 screws are missing. CR-IP3-2013-01634 was generated.

References:

SEWS for 38MCC
9321-F-25023 Containment Building General Arrangement Plan "D-D" above EL. 68'-0"
CR-IP3-2013-01634
CR-IP3-2013-01635
AWC-51

Evaluated by: *Dan Nuta* Date: *3/15/2013*

Kai Lo *3/15/2013*

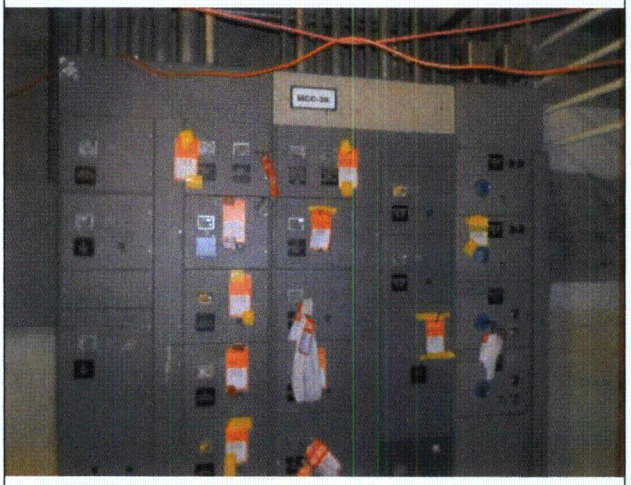
Status: Y☒ N☐ U☐

Seismic Walkdown Checklist (SWC) **SWEL1-010**

Equipment ID No. *38MCC* Equip. Class[1] *1*

Equipment Description *CONTAINMENT MOTOR CONTROL CENTER 38*

Photographs



Note: *38MCC*

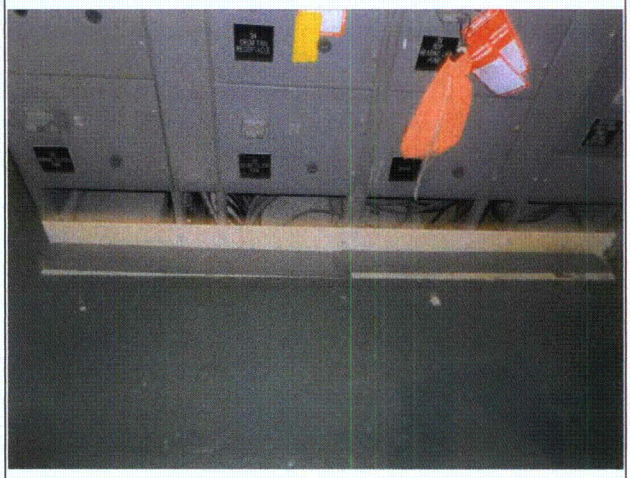
Note: *Anchorage at the rear*

Status: Y☒ N☐ U☐

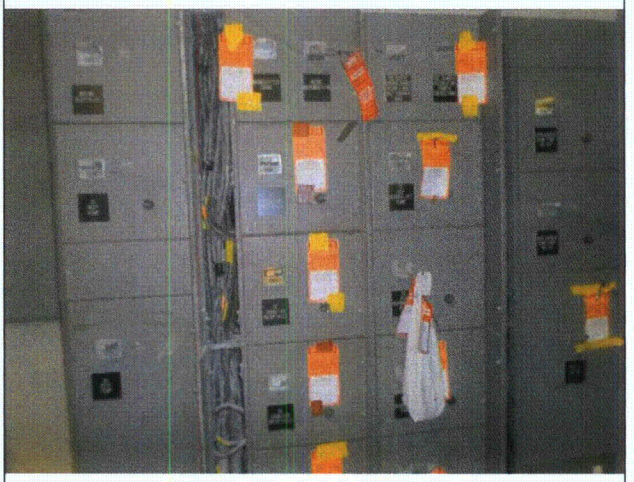
Seismic Walkdown Checklist (SWC) SWEL1-010

Equipment ID No. *38MCC* Equip. Class[1] *1*

Equipment Description *CONTAINMENT MOTOR CONTROL CENTER 38*



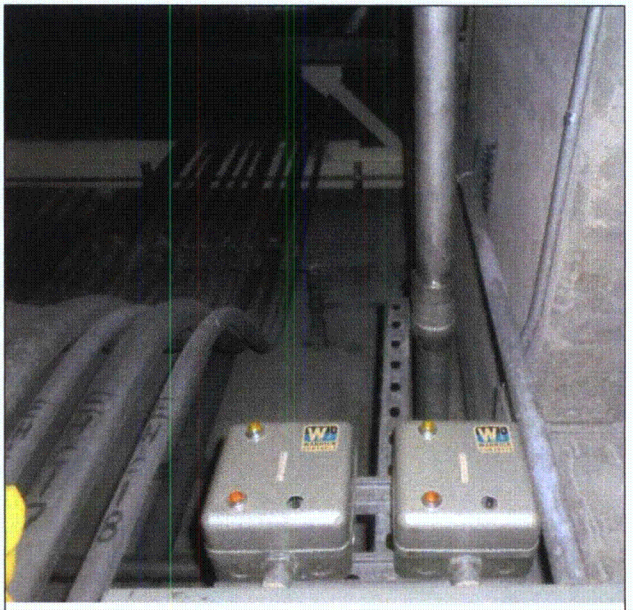
Note: *Front anchorage and removed front panels*



Note: *vertical wire ways opened to inspect internal internal structural connectors.*

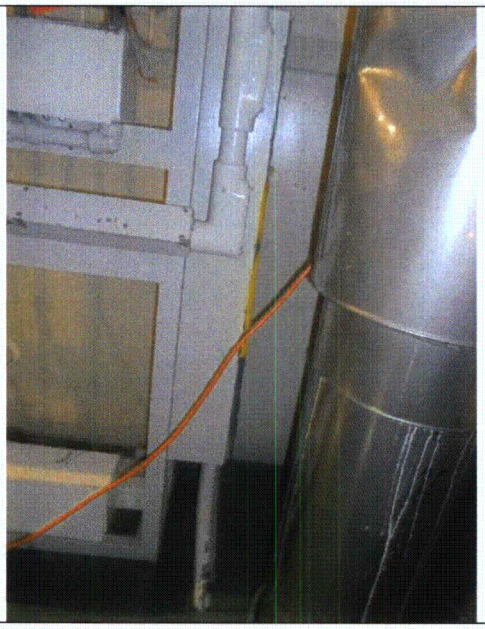
Photographs

Note: *¾" gap between top of MCC and concrete wall*



Note: *Unistrut support for an instrument serving the 38MCC is touching a DW pipe (for fie protection)*

Photographs



Note: *Rack 16's panel is missing 5 out of 10 screws while using a duct tape as a substitute.*

Note:

Status: Y☒ N☐ U☐ Rev. 1

Seismic Walkdown Checklist (SWC) SWEL1-011

Equipment ID No. *37MCC* Equip. Class[1] *1*

Equipment Description *PRIMARY AUX BUILDING MCC*

Location: Bldg. *PA* Floor El. *55'-0"* Room, Area

Manufacturer, Model, Etc. (optional but recommended)

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1. Is the anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)? Y☐ N☒

   Not part of the anchorage checks.

2. Is the anchorage free of bent, broken, missing or loose hardware? Y☒ N☐ U☐ N/A☐

   Upper and lower panels, vertical wireways were opened for anchorage inspection.

3. Is the anchorage free of corrosion that is more than mild surface oxidation? Y☒ N☐ U☐ N/A☐ Rev. 1

   Upper and lower panels, vertical wireways were opened for anchorage inspection.

4. Is the anchorage free of visible cracks in the concrete near the anchors? Y☒ N☐ U☐ N/A☐

   Upper and lower panels, vertical wireways were opened for anchorage inspection.

[1] Enter the equipment class name from EPRI 1025286, Appendix B: Classes of Equipment.

Status: Y☒ N☐ U☐ Rev. 1

Seismic Walkdown Checklist (SWC) SWEL1-011

Equipment ID No. *37MCC* Equip. Class[1] *1*

Equipment Description *PRIMARY AUX BUILDING MCC*

5. Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.) Y☐ N☐ U☐ N/A☒

   Not applicable since the anchorage configuration verification is not required.

6. Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions? Y☒ N☐ U☐ Rev. 1

   Upper and lower panels, vertical wireways were opened for anchorage inspection right before 3R17.

Interaction Effects

7. Are soft targets free from impact by nearby equipment or structures? Y☒ N☐ U☐ N/A☐

   Yes, soft targets are free from impact by nearby equipment or structures.

8. Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment? Y☒ N☐ U☐ N/A☐ Rev 1

   Fluorescent bulbs need not be restrained to the fixture. This was accepted generically.

9. Do attached lines have adequate flexibility to avoid damage? Y☒ N☐ U☐ N/A☐

   Yes, attached lines have adequate flexibility to avoid damage.

10. Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects? Y☒ N☐ U☐ Rev 1

    Fluorescent bulbs need not be restrained to the fixture. This was accepted generically.

Status: Y☒ N☐ U☐ Rev. 1

Seismic Walkdown Checklist (SWC) SWEL1-011

Equipment ID No. *37MCC* Equip. Class[1] *1*

Equipment Description *PRIMARY AUX BUILDING MCC*

Other Adverse Conditions

11. Have you looked for and found no other seismic conditions that could adversely affect the safety functions of the equipment? Y☒ N☐ U☐

    Yes, we have looked for and found no other seismic conditions that could adversely affect the safety functions of the equipment. Rev. 1

Comments (Additional pages may be added as necessary)

The following condition was observed:

1. Row 4, bottom panel has 1 out of 3 screws missing. This is structurally acceptable because the panel is light and remaining screws have sufficient capacity to hold the door during a seismic event.
2. Row 2, top panel has 1 out of 3 screws missing. This is structurally acceptable because the panel is light and remaining screws have sufficient capacity to hold the door during a seismic event.
3. Row 2, bottom panel has 1 out of 3 screws missing. This is structurally acceptable because the panel is light and remaining screws have sufficient capacity to hold the door during a seismic event.
4. Row 3, bottom panel has 1 out of 3 screws missing. This is structurally acceptable because the panel is light and remaining screws have sufficient capacity to hold the door during a seismic event.
5. Row 5, bottom panel has 1 out of 3 screws missing. This is structurally acceptable because the panel is light and remaining screws have sufficient capacity to hold the door during a seismic event.
6. Row 7, bottom panel has 1 out of 3 screws missing. This is structurally acceptable because the panel is light and remaining screws have sufficient capacity to hold the door during a seismic event.
7. From vertical wire way opening, cubicle 2RMR and 7FMR may have missing screws for their terminal strip block bracket. Later on, it was determined from a review of the drawing by electrical engineering that there are terminal blocks inside. Thus, no unacceptable condition.

References:
SEWS Sheet 480 VAC MCC
IP3V-439-0928-4 Motor Control Center – Type W Arrangement
IP3V-439-0927-3 Motor Control Center- Type W Arrangement
IP3V-439-0930-4 Motor Control Center- Type W Arrangement
AWC-028

Status: Y☒ N☐ U☐ Rev. 1

Seismic Walkdown Checklist (SWC) SWEL1-011

Equipment ID No. *37MCC* Equip. Class[1] *1*

Equipment Description *PRIMARY AUX BUILDING MCC*

Evaluated by: *Dan Nuta* Date: *2/13/13*

Kai Lo Date: *2/13/13*

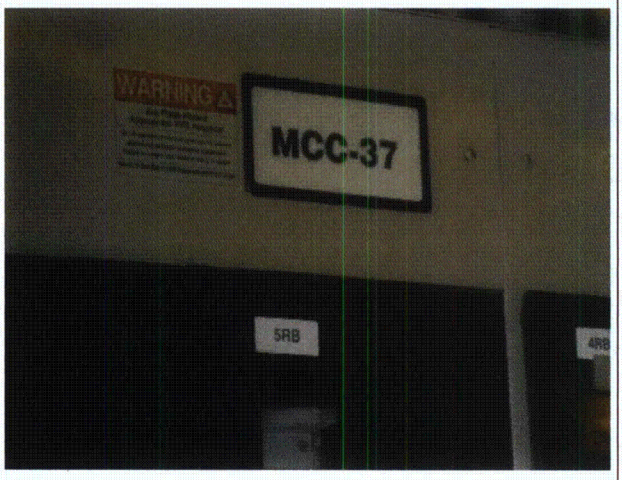
Status: Y☒ N☐ U☐ Rev. 1

Seismic Walkdown Checklist (SWC) **SWEL1-011**

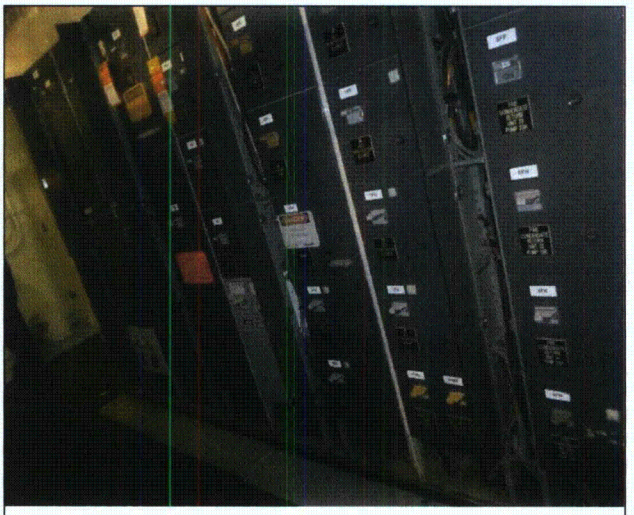
Equipment ID No. *37MCC* Equip. Class[1] *1*

Equipment Description *PRIMARY AUX BUILDING MCC*

Photographs



Note: *MCC-37 Tag*

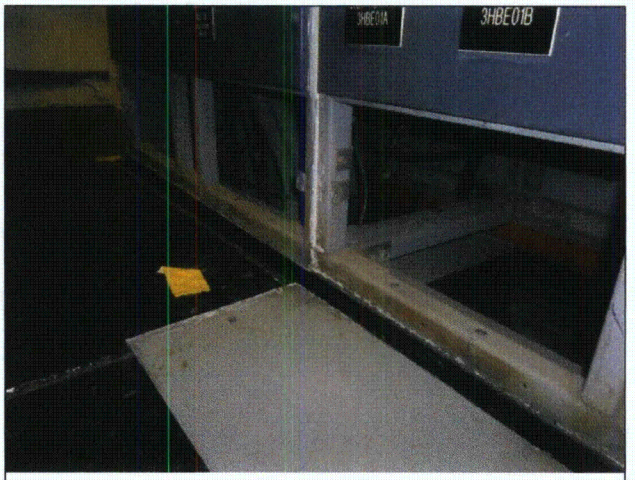


Note: *MCC-37*

R1

Photographs

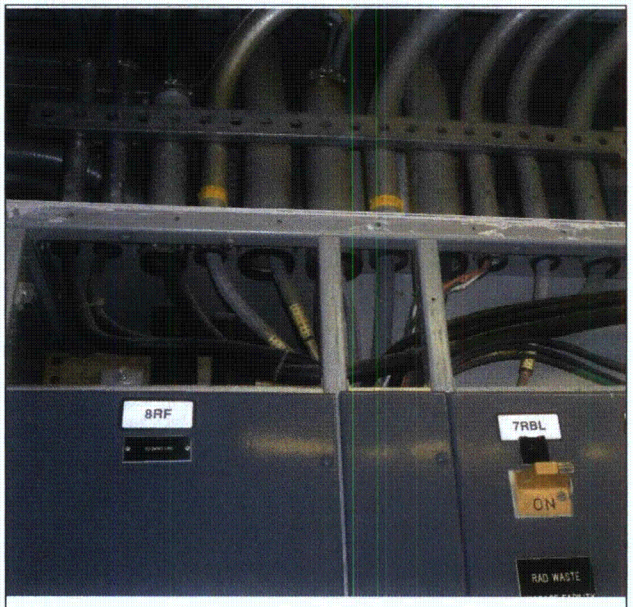
Note:



Note:

R1

Photographs



Note:

Note:

R1

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-012

Equipment ID No. *39MCC* Equip. Class[1] *1*

Equipment Description *CONTROL BUILDING MOTOR CONTROL CENTER 39*

Location: Bldg. *CB* Floor El. *33'-0"* Room, Area

Manufacturer, Model, Etc. (optional but recommended)

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1. Is the anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)? Y☐ N☒

   Not part of anchor checks.

2. Is the anchorage free of bent, broken, missing or loose hardware? Y☒ N☐ U☐ N/A☐

   The upper, lower and wire way panels were opened and inspected in 3R17. Anchorage is free of bent, broken, missing or loose hardware.

3. Is the anchorage free of corrosion that is more than mild surface oxidation? Y☒ N☐ U☐ N/A☐ R1

   The upper, lower and wire way panels were opened and inspected in 3R17. Anchorage is free of corrosion that is more than mild surface.

4. Is the anchorage free of visible cracks in the concrete near the anchors? Y☒ N☐ U☐ N/A☐

   There are coating cracks that are away from the anchors, and no concrete cracks.

[1] Enter the equipment class name from EPRI 1025286. Appendix B: Classes of Equipment.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-012

Equipment ID No. *39MCC* Equip. Class[1] *1*

Equipment Description *CONTROL BUILDING MOTOR CONTROL CENTER 39*

5. Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.) Y☐ N☐ U☐ N/A☒

   Not applicable since component is not part of the anchorage configuration verification.

6. Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions? Y☒ N☐ U☐ R1

Interaction Effects

7. Are soft targets free from impact by nearby equipment or structures? Y☒ N☐ U☐ N/A☐

   Yes, soft targets are free from impact by nearby equipment or structures.

8. Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment? Y☒ N☐ U☐ N/A☐ R1

   Fluorscent bulbs not restrained to the fixture was accepted generically.

9. Do attached lines have adequate flexibility to avoid damage? Y☒ N☐ U☐ N/A☐

   Yes, attached lines have adequate flexibility to avoid damage.

10. Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects? Y☒ N☐ U☐ R1

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-012

Equipment ID No. *39MCC* Equip. Class[1] *1*

Equipment Description *CONTROL BUILDING MOTOR CONTROL CENTER 39*

Other Adverse Conditions

11. Have you looked for and found no other seismic conditions that could adversely affect the safety functions of the equipment? Y☒ N☐ U☐

Compartment 3G cover and compartment directly above 6K on panel 39MCC are missing two screws out of four. The covers are held with two screws which are judged to be sufficient since the compartment covers are small.

Cable tray immediately in front of 39MCC had cables with broken zip ties (the cables were not tied to the cable tray). However, the cables are adequately placed inside the tray and will not dislodge during a seismic event. This is judged to be acceptable.

See additional comments below.

Comments (Additional pages may be added as necessary)

The following conditions were observed but none of them are structurally significant. The cover panels were found to have missing screws. There is no operability concern because the weight of each panel is fairly light and the remaining screws have sufficient capacity to support the panel during a design basis earthquake.CR-IP3-2013-01788 and WR-302229 were generated. R1

(1) On the left side panel, 1 out of 16 screws are missing.

(2) On the right side panel, 1 out of 16 screws are missing.

(3) On the bottom panel, 1 out of 3 screws are missing.

(4) On the cubicle 3G cover panel, 2 out of 4 screws are missing.

(5) On the cover panel of the cubicle above cubicle 6K, , 2 out of 4 screws are missing.

(6) On the cover panel of Box XZ21, above the MCC, , 1 out of 8 screws are missing

References:
9321-F-33833-12 Electrical Nodes for Equipment in Control Building, Sections A-A and B-B
SK-024 MCC-39 480 VAC MCC, Control Building El 33'-0", Civil/Structural
SEWS Sheets
CR-IP3-2013-01788
AWC-007

Evaluated by: *Dan Nuta* Date: *3/18/2013*

Kai Lo *3/18/2013*

Status: Y☒ N☐ U☐

R1

Seismic Walkdown Checklist (SWC) **SWEL1-012**

Equipment ID No. *39MCC* Equip. Class[1] *1*

Equipment Description *CONTROL BUILDING MOTOR CONTROL CENTER 39*

Photographs

Note: *Box XZ21 above the MCC is missing 1 out of 8 screws*

Note: *Enlarges view of cubicle 3G and the cubicle above 6K will show the missing screws.*

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-013

Equipment ID No. *36CMCC* Equip. Class[1] *1*

Equipment Description *PAB MOTOR CONTROL CENTER 36C*

Location: Bldg. *CB* Floor El. *15'-0"* Room, Area *SWITCHGEAR ROOM*

Manufacturer, Model, Etc. (optional but recommended) _____

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1. Is the anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)? Y☒ N☐

   Yes, check the anchorage

2. Is the anchorage free of bent, broken, missing or loose hardware? Y☒ N☐ U☐ N/A☐

   Anchorage is inside of the cabinet and doors must be opened to examine the anchorage. Cabinet was opened in 3R17, bottom, top and wire way panels were opened to inspect the anchorage.

3. Is the anchorage free of corrosion that is more than mild surface oxidation? Y☒ N☐ U☐ N/A☐

   Cabinet was opened in 3R17, bottom, top and wire way panels were opened to inspect the anchorage. The anchorage is free of corrosion that is more than mild surface oxidation.

4. Is the anchorage free of visible cracks in the concrete near the anchors? Y☒ N☐ U☐ N/A☐

   Cabinet was opened in 3R17, bottom, top and wire way panels were opened to inspect the anchorage. The anchorage is free of visible cracks in the concrete near the anchors.

[1] Enter the equipment class name from EPRI 1025286, Appendix B: Classes of Equipment.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-013

Equipment ID No. *36CMCC* Equip. Class[1] *1*

Equipment Description *PAB MOTOR CONTROL CENTER 36C*

5. Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.) Y☒ N☐ U☐ N/A☐

   Cabinet was opened in 3R17, bottom, top and wire way panels were opened to inspect the anchorage. R1

6. Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions? Y☒ N☐ U☐

Interaction Effects

7. Are soft targets free from impact by nearby equipment or structures? Y☒ N☐ U☐ N/A☐

   Target is free from impact by nearby equipment and structures.

8. Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment? Y☒ N☐ U☐ N/A☐

   Tray over the cabinet is supported on long rod hangers. The trays are probably not seismically supported but they are hightly damped. This is considered acceptable.

9. Do attached lines have adequate flexibility to avoid damage? Y☒ N☐ U☐ N/A☐

   Attached lines have adequate flexibility to avoid damage.

10. Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects? Y☒ N☐ U☐

    Yes, based on the above seismic interaction evaluations, the equipment is free of potentially adverse seismic interaction effects.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-013

Equipment ID No. *36CMCC* Equip. Class[1] *1*

Equipment Description *PAB MOTOR CONTROL CENTER 36C*

Other Adverse Conditions

11. Have you looked for and found no other seismic conditions that could adversely affect the safety functions of the equipment? Y☒ N☐ U☐

    Yes, we have looked for and found no other seismic conditions that could adversely affect the safety functions of the equipment.

Comments (Additional pages may be added as necessary)

Cabinet was opened in 3R17, bottom, top and wire way panels were opened to inspect the anchorage. Unprotected cubicles were opened to observe the internal conditions. R1

References:
SEWS Worksheets
SK-021 Sheet 1 of 1 R0 MCC-36C 480 VAC MCC, Control Building El 15'-0" Civil/Structural
9321-F-30523-50 Equipment Arrangement, Control Building
AWC-002

Evaluated by:

Dan Nuta Dragos A. Nuta Date: *3/8/2013*

Kai Lo K. C. Date: *3/8/2013*

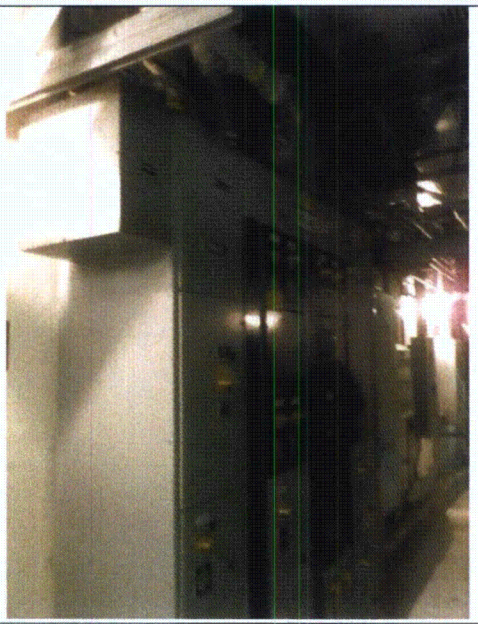
Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-013

Equipment ID No. *36CMCC* Equip. Class[1] *1*

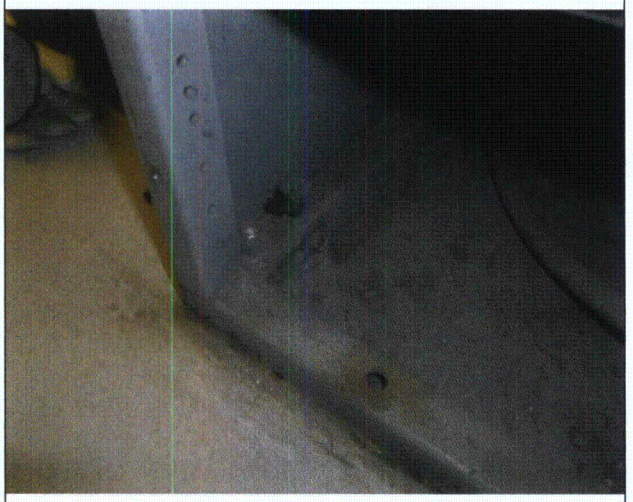
Equipment Description *PAB MOTOR CONTROL CENTER 36C*

Photographs



Note:

36CMCC



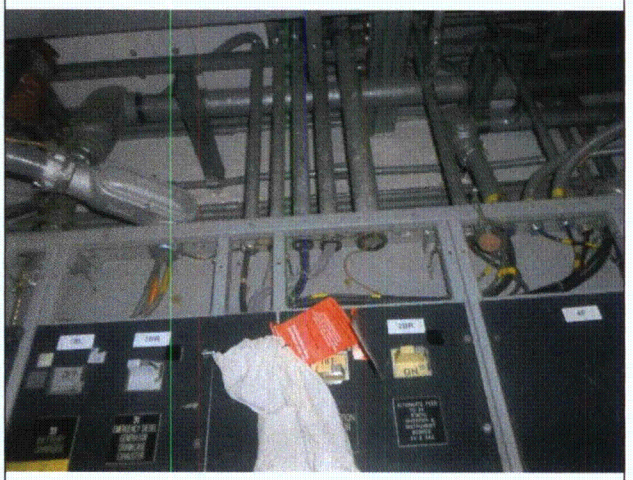
Note:

Opened bottom panel to inspect anchorage.

Photographs

Note:

Opened bottom panels to inspect anchorage and interior connection.



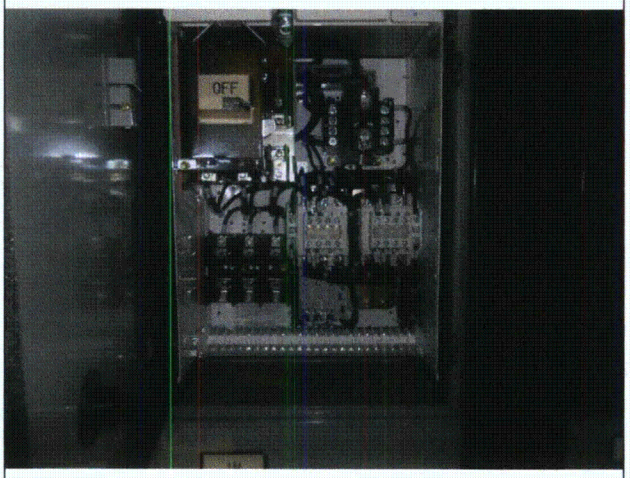
Note:

Opened top panels to inspect anchorage and interior connections.

Photographs

Note:

Opened vertical wireways to inspection interior and connections.



Note:

Opened cubicle door to nspect interior.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-014

Equipment ID No. *SWGR 31* Equip. Class[1] *2*

Equipment Description *480VAC SWGR 31 (BUS 2A AND BUS 5A)*

Location: Bldg. *CB* Floor El. *15'-0"* Room, Area *SWITCHGEAR ROOM*

Manufacturer, Model, Etc. (optional but recommended) _____

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1. Is the anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)? Y☐ N☒

   NOT PART OF ANCHOR CHECKS

2. Is the anchorage free of bent, broken, missing or loose hardware? Y☒ N☐ U☐ N/A☐

   The bottom cubicle doors were opened for anchorage and interior inspection. The weld deposited in the slots are covered with dust. The Hikti Kwik Bolts and base angle iron are in good condition.

3. Is the anchorage free of corrosion that is more than mild surface oxidation? Y☒ N☐ U☐ N/A☐ R1

   The bottom cubicle doors were opened for anchorage and interior inspection.Just mild surface corrosion was found on the anchorage.

4. Is the anchorage free of visible cracks in the concrete near the anchors? Y☒ N☐ U☐ N/A☐

   The bottom cubicle doors were opened for anchorage and interior inspection. There are no obserable cracks in the anchorage area.

[1] Enter the equipment class name from EPRI 1025286. Appendix B: Classes of Equipment.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-014

Equipment ID No. *SWGR 31* Equip. Class[1] *2*

Equipment Description *480VAC SWGR 31 (BUS 2A AND BUS 5A)*

5. Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.) Y☐ N☐ U☐ N/A☒

   Not applicable since component is not part of the anchorage configuration verification.

6. Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions? Y☒ N☐ U☒ R1

   The bottom cubicle doors were opened for anchorage and interior inspection.

Interaction Effects

7. Are soft targets free from impact by nearby equipment or structures? Y☒ N☐ U☒ N/A☐

8. Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment? Y☒ N☐ U☐ N/A☐

   1. *Lights without restraint are acceptable because the mass is light and break apart upon impact.*
   2. *The monorail above MCC is locked.*
   3. *Block wall has been addressed in the evaluation for IE80-11.*

   R1

9. Do attached lines have adequate flexibility to avoid damage? Y☒ N☐ U☐ N/A☐

   Conduits on top of the cabinet have adequate flexibility.

10. Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects? Y☒ N☐ U☐

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-014

Equipment ID No. *SWGR 31* Equip. Class[1] *2*

Equipment Description *480VAC SWGR 31 (BUS 2A AND BUS 5A)*

Other Adverse Conditions

11. Have you looked for and found no other seismic conditions that could adversely affect the safety functions of the equipment? Y☒ N☐ U☐

Comments (Additional pages may be added as necessary)

Note: Bus 2A was inspected pre-outage on 2/19/2013 while Bus 5A was inspected during 3R17 on 3/18/2013.

CR-IP3-2013-00675 and WR 299488 was created.

For Bus 2A only:

1. Inside the fuse panel on row 32 (above the spare EC 16500), there is a fuse block lying on the shelf of the cubicle. The horizontal seismic acceleration is low and the weight of the fuse block is minimal. Assuming the fuse block will move under inertial effects, there will be very low energy and no adverse seismic interaction is expected. Nevertheless, the fuse block should be removed.

2. Inside cubicle 52/LT IN, there is a loose nut on the concrete floor below the breaker rack. This is a housekeeping issue only.

3. On row 33, the cubicle above cubicle MCC33, a fuse block (with no fuse) is lying on the shelf of the cubicle. The horizontal seismic acceleration is low and the weight of the fuse block is minimal. Assuming the fuse block will move under inertial effects, there will be very low energy and no adverse seismic interaction is expected. Nevertheless, the fuse block should be removed. R1

4. On row 34, inside the first cubicle from top (above 52-2A cubicle), one of the two connectors providing support for a wire way is missing. Since the wire way with the wires inside is fairly light and the horizontal seismic acceleration is low, the seismic and normal forces acting on the connector will be minimal. One connector is judged to be adequate from a seismic perspective. Nevertheless, the missing connector should be replaced.

5. In the back of the Switchgear 31, there is an upper and lower panel on row 31. Both panels are missing one out of six screws. Since the horizontal seismic acceleration is low, the five existing screws will be structurally adequate. Nevertheless, the missing screw should be re-installed.

For Bus 5A only:

1. *Fuse blocks are lying on the shelf of the upper cubicles because the Switchgear is being serviced.*

References:

SEWS for SWGR 31

SK-014 480V SWGR #31

CR-IP3-2013-00675

AWC-44

Status: Y☒ N☐ U☐

Seismic Walkdown Checklist (SWC) SWEL1-014 R1

Equipment ID No. *SWGR 31* Equip. Class[1] *2*

Equipment Description *480VAC SWGR 31 (BUS 2A AND BUS 5A)*

Evaluated by: *Dan Nuta* Date: *3/18/2013*

Kai Lo *3/18/2013*

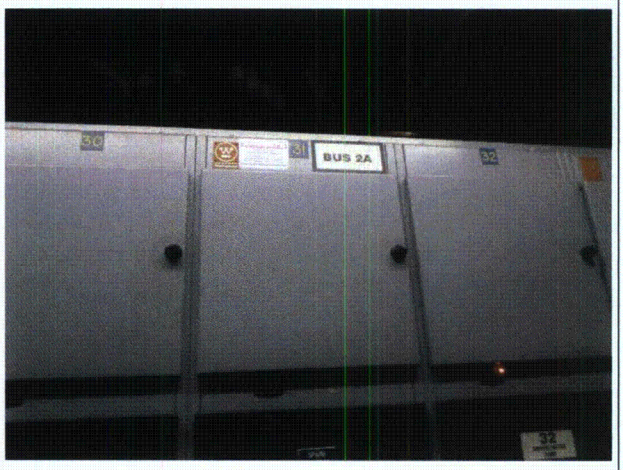
Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) **SWEL1-014**

Equipment ID No. *SWGR 31* Equip. Class[1] *2*

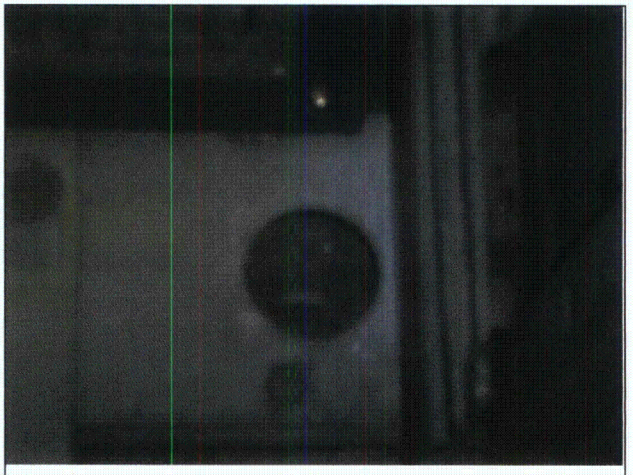
Equipment Description *480VAC SWGR 31 (BUS 2A AND BUS 5A)*

Photographs



Note:

SWGR31 Bus 2A



R1

Note:

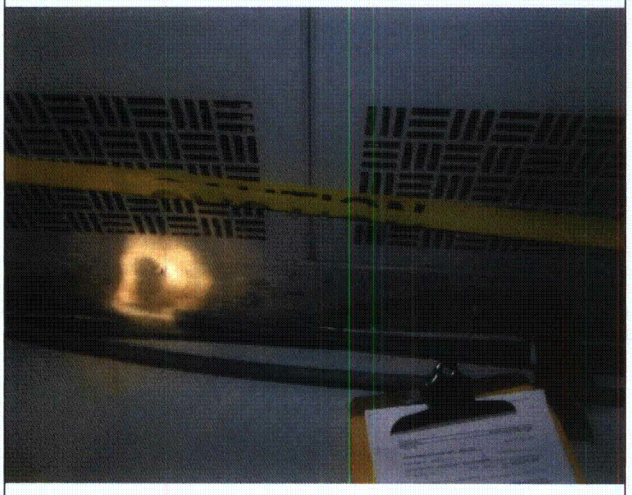
Anchorage in the front with the door opened.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-014

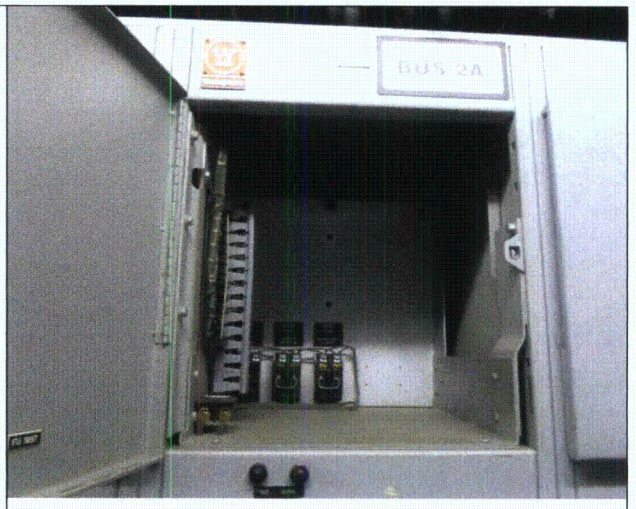
Equipment ID No. *SWGR 31* Equip. Class[1] *2*

Equipment Description *480VAC SWGR 31 (BUS 2A AND BUS 5A)*



Note:

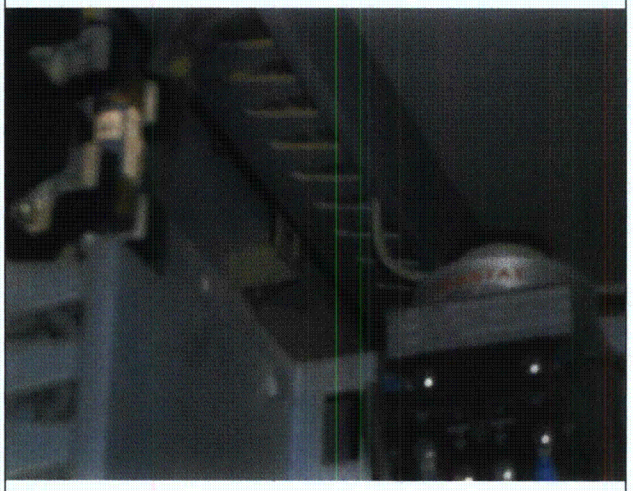
Anchorage in the rear.



R1

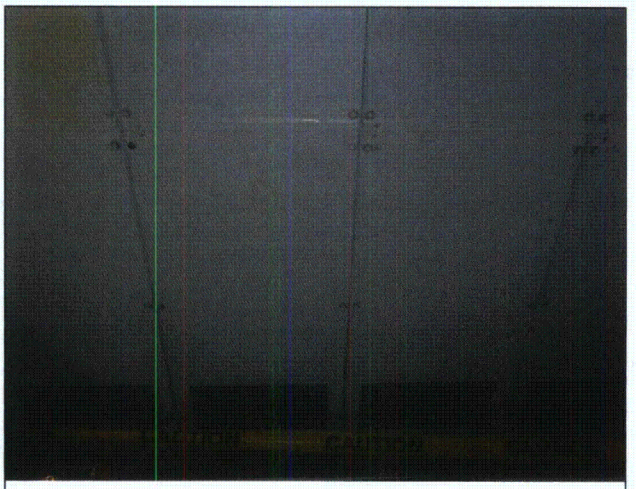
Note:

Cubicle door opened with fuse blocks lying on the shelf.



Note:

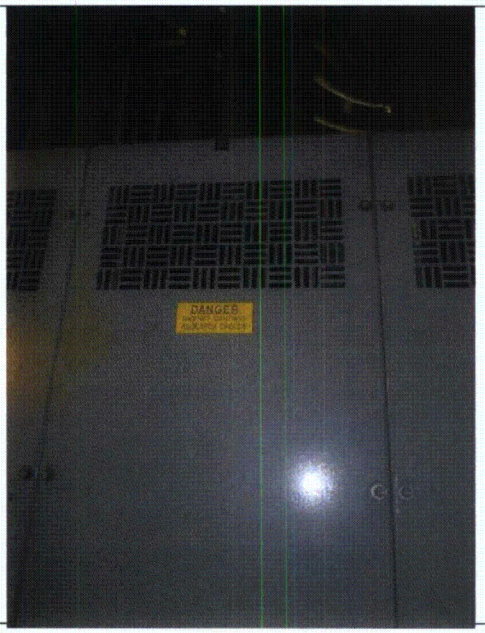
Wireway has no clip connection.



Note:

Missing screws on the panel cover.

R1



Note:

Missing screws on the panel cover.

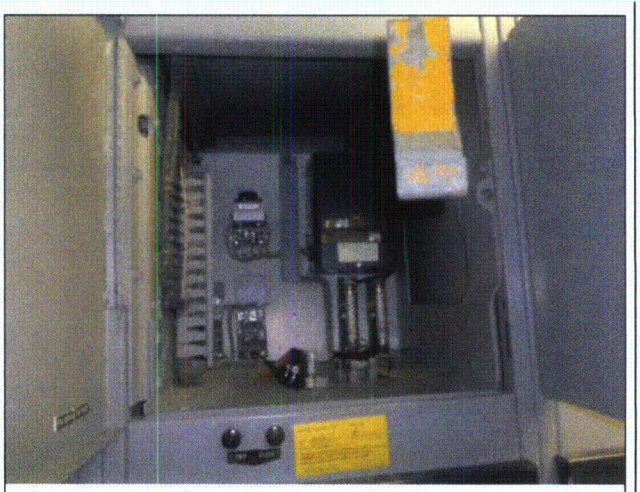
Note:

SWGR 31 Bus 5A

R1

Note:

Cubicle door opened for anchorage inspection.



Note:

Fuse blocks were lying on the shelf of the upper cubicles because the Switchgear was being serviced.

R1

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-015

Equipment ID No. *SWGR 32* Equip. Class[1] *2*

Equipment Description *480VAC SWGR 32 (BUS 3A & BUS 6A)*

Location: Bldg. *CB* Floor El. *15'-0"* Room, Area *SWITCHGEAR ROOM*

Manufacturer, Model, Etc. (optional but recommended) _____

Instructions for Completing Checklist

This checklist may be used to document the results of the Seismic Walkdown of an item of equipment on the SWEL. The space below each of the following questions may be used to record the results of judgments and findings. Additional space is provided at the end of this checklist for documenting other comments.

Anchorage

1. Is the anchorage configuration verification required (i.e., is the item one of the 50% of SWEL items requiring such verification)? Y☐ N☒
   NOT PART OF ANCHOR CHECKS
2. Is the anchorage free of bent, broken, missing or loose hardware? Y☒ N☐ U☐ N/A☐

   Lower cubicle doors were opened to inspect the intermittant welds. Dusty and slight surface rust observed. Angle iron and Hilti Bolts are used for anchorage on the other side of the switchgear.
3. Is the anchorage free of corrosion that is more than mild surface oxidation? Y☒ N☐ U☐ N/A☐ R1

   See answer to question #2.
4. Is the anchorage free of visible cracks in the concrete near the anchors? Y☒ N☐ U☐ N/A☐

   No visible crack extends from to the bolt to outside of the angle iron.
5. Is the anchorage configuration consistent with plant documentation? (Note: This question only applies if the item is one of the 50% for which an anchorage configuration verification is required.) Y☐ N☐ U☐ N/A☒
   Not applicable since component is not part of the anchorage configuration verification.
6. Based on the above anchorage evaluations, is the anchorage free of potentially adverse seismic conditions? Y☒ N☐ U☐
   See answer to question #2.

[1] Enter the equipment class name from EPRI 1025286. Appendix B: Classes of Equipment.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-015

Equipment ID No. *SWGR 32* Equip. Class[1] *2*

Equipment Description *480VAC SWGR 32 (BUS 3A & BUS 6A)*

Interaction Effects

7. Are soft targets free from impact by nearby equipment or structures? Y☒ N☐ U☐ N/A☐

8. Are overhead equipment, distribution systems, ceiling tiles and lighting, and masonry block walls not likely to collapse onto the equipment? Y☒ N☐ U☐ N/A☐ R1

   Unrestrained fluorescent light tube was accepted generically.
   Masonry block wall was addressed by the evaluation for IE 80-11 program.

9. Do attached lines have adequate flexibility to avoid damage? Y☒ N☐ U☐ N/A☐

10. Based on the above seismic interaction evaluations, is equipment free of potentially adverse seismic interaction effects? Y☒ N☐ U☐

Other Adverse Conditions

11. Have you looked for and found no other seismic conditions that could adversely affect the safety functions of the equipment? Y☒ N☐ U☐

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-015

Equipment ID No. *SWGR 32* Equip. Class[1] *2*

Equipment Description *480VAC SWGR 32 (BUS 3A & BUS 6A)*

Comments (Additional pages may be added as necessary)

CR-IP3-2013-00765 was created for the following condition.

For Bus 3A side:

Inside the fuse panel on row 7 (above 3AT6A), a control fuse block for tie breaker Bus 6A to 3A was pulled out and found lying on the shelf of the cubicle. The operator said that the IP3 SOP requires the fuse block be placed on the shelf in contradiction with the IP2 procedure which requires rotating the fuse block 180 degrees and re-inserted into the slot to show the fuse in "off" position. The horizontal seismic acceleration is low and the weight of the fuse block is minimal. Assuming the fuse block will move under inertial effects, there will be very low energy and no adverse seismic interaction is expected.

For Bus 6A side:

Inside the fuse panel on row 10, the fuse block for SWP33 was pulled out and found lying on the shelf of the cubicle. This is similar to the issue found on Bus 3A side. The horizontal seismic acceleration is low and the weight of the fuse block is minimal. Assuming the fuse block will move under inertial effects, there will be very low energy and no adverse seismic interaction is expected. R1

CR-IP3-2013-00767 is created for the following condition. WR-299868 was generated.

1. On row 8, inside cubicle for 6A relays, the plastic clip for the wire was detached from the wall of the metal compartment because the glue was dried out. A few instances were observed. The horizontal seismic acceleration is low and the weight of the wire is minimal. Assuming the wire will move under inertial effects, there will be very low energy, insignificant displacement and no adverse seismic interaction is expected.

2. There is a loose rivet at the door hinge for the 35FCU cubicle. WR# 00147781 was found on the door.

3. On row 14, inside the upper most cubicle, one of the two connectors providing support for a wire way is missing. Since the wire way with the wires inside is fairly light and the horizontal seismic acceleration is low, the seismic and normal forces acting on the connector will be minimal. One connector is judged to be adequate from a seismic perspective.

4. 3 cover panels for the Station Transformer #6 have missing screws: The front panel is missing 2 out of 10 screws. Two back panels are missing 1 out of 10 screws. Since the horizontal seismic acceleration is low, the remaining eight screws will be structurally adequate

5. 3 cover panels for the Station Transformer #3 have missing screws: The two front panels are missing 1 out of 10 screws. The back panel is missing 2out of 10 screws. Since the horizontal seismic acceleration is low, the remaining eight screws will be structurally adequate.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-015

Equipment ID No. *SWGR 32* Equip. Class[1] *2*

Equipment Description *480VAC SWGR 32 (BUS 3A & BUS 6A)*

References:
SEWS for SWGR 32
SK – 015 480V SWGR #32
CR-IP3-2013-00765
CR-IP3-2013-00767
AWC-44

R1

Evaluated by:

Dan Nuta *2/21/2013*

Kai Lo *2/21/2013*

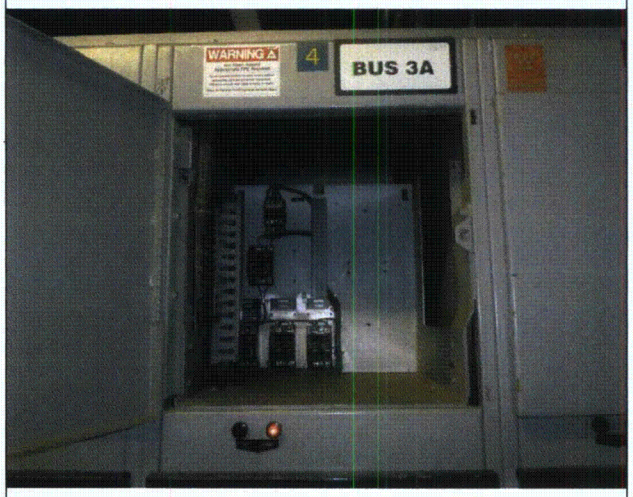
Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) **SWEL1-015**

Equipment ID No. *SWGR 32* Equip. Class[1] *2*

Equipment Description *480VAC SWGR 32 (BUS 3A & BUS 6A)*

Photographs



Note:

Opened a top cubicle door.

Note:

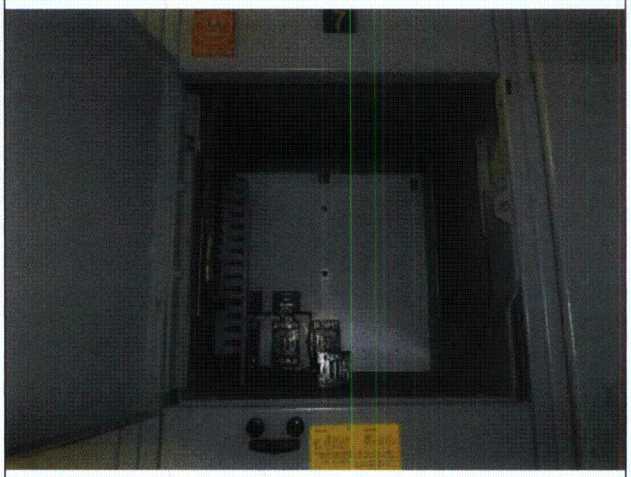
Opened a bottom cubicle door to inspect anchorage.

Status: Y☒ N☐ U☐ R1

Seismic Walkdown Checklist (SWC) SWEL1-015

Equipment ID No. *SWGR 32* Equip. Class[1] *2*

Equipment Description *480VAC SWGR 32 (BUS 3A & BUS 6A)*



Note:

Fuse blook lying on the shelf.

Note: