NMC
Committed to Nuclear Excellence

Monticello Nuclear Generating Plant
Operated by Nuclear Management Company, LLC

February 24, 2004

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10 CFR 50.12

US Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Monticello Nuclear Generating Plant
Docket 50-263
License No. DPR-22

Response To Request For Additional Information Related to the Fire Protection Exemption Request for the Torus Compartment (TAC No. MC0751)

Reference 1) NMC letter to NRC, "Exemption Request from the Requirements of 10 CFR 50, Appendix R Section III.G.2 for Fire Area IV/Fire Zone 1F – Torus Compartment," dated September 15, 2003

Reference 2) NRC letter to NMC, "Monticello Nuclear Generating Plant – Request for Additional Information Related to the Fire Protection Exemption Request for the Torus Compartment (TAC No. MC0751)," dated January 30, 2004

In Reference 1, Nuclear Management Company, LLC (NMC) requested Nuclear Regulatory Commission (NRC) to authorize a permanent exemption from the automatic fire suppression system requirements of 10CFR 50, Appendix R, Section III.G.2.b as it applies to Fire Area IV/Fire Zone 1F – Torus Compartment.

In Reference 2, the NRC requested that additional information be provided to support the exemption requested in Reference 1.

Enclosure 1 contains NMC's response to the requested information by the NRC. Enclosure 2 contains revised figures for the exemption request. The revised figures supercede the figures provided in Reference 1. The changes in the Figures have lead to other minor, textual changes in Reference 1. See Enclosure 1 for details.

This letter makes no new commitments or changes to any existing commitments.

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2807 West County Road 75 • Monticello, Minnesota 55362-9637
Telephone: 763.295.5151 • Fax: 763.295.1454

If you have any questions please contact John Fields, Senior Regulatory Affairs Engineer (763-295-1663).

Thomas J. Palmisano
Site Vice President, Monticello Nuclear Power Plant
Nuclear Management Company, LLC

Enclosures (2)

cc: Administrator, Region III, USNRC
Project Manager, Monticello, USNRC
Resident Inspector, Monticello, USNRC

ENCLOSURE 1

NMC RESPONSES TO NRC REQUEST FOR ADDITIONAL INFORMATION

NRC Request #1:

Division 1 level transmitter LT7338A and its cable are shown on Figure 2 of Nuclear Management Company, LLC's (NMC's), letter of September 15, 2003. A notation on Figure 1 in NMC's letter shows where the cable for LT7338A exits through the ceiling. The cable does not appear to extend to where the penetration is located. What is the correct depiction?

NMC Response:

The correct depiction of the cable associated with LT-7338A, indicates that the conduit extends to the penetration. Therefore a revision to the Figure 1 was required. However, upon review NMC thought additional clarity was still required.

Therefore, information related to instrumentation in the Torus area has been eliminated from Figure 1 and transferred to Figure 2 as appropriate. All information associated with instrumentation is now detailed on Figure 2. Depicting instrumentation on a single figure serves to clarify the component and cable arrangements within the Torus Compartment.

Revised figures are provided in Enclosure 2. Additional changes to the figures are identified in the NMC Response to NRC Request #2, immediately below, and in the Additional Information section provided at the end of this Enclosure. The revised figures supercede the figures provided in Reference 1.

NRC Request #2:

Figure 2 shows that Division 2 level transmitter LT7338B is connecting to the same conduit system downstream of Division 2 temperature element TE4075B, while Division 2 temperature elements TE4073B and TE4074B are shown as exiting the torus room at column lines L and 5.1. Is this an accurate representation? Note that the opening statement in Attachment 1, Section B, "Background," of NMC's letter of September 15, 2003, discusses the incorrect depiction of the Division II suppression pool level transmitter in your submittal of October 28, 1982.

NMC Response:

No, this was an inaccurate representation. Figure 2 has been revised to reflect the conduit route of LT-7338B, independent of other Division II conduits, to agree with the configuration in the plant. Also, the exit point of the transmitter cable has been shown.

Previously, the divisional conduits were shown in "one-line" fashion in order to simplify the information on Figure 2. In addition, not all Division II temperature element conduits were shown connected to the exit point at approximate coordinates 5.1/ L in Reference 1, Figure 2.

A revised Figure 2 is provided in Enclosure 2.

NRC Request #3:

For the suppression pool temperature monitoring system, discuss how the system automatically eliminates 1) a failed temperature element or 2) fire-induced failure of the cable to the temperature elements that is inside conduit (hot short, short to ground, open, or increased/decreased resistance or voltage).

NMC Response:

Suppression Pool Temperature Monitoring System (SPOTMOS) is a microprocessor-based system. SPOTMOS consists of two redundant divisions. Each of the eight temperature sensors per division is a 100-ohm platinum Resistance Temperature Detector (RTD), thus establishing one temperature sensitive resistance loop per sensor. Programming in the microprocessor automatically eliminates signals from the weighted average bulk temperature calculation when indicated temperature (resistance) is outside the allowable range of 30°F to 240°F (99.6 ohms to 144.4 ohms). The suppression pool is maintained at a minimum temperature of 65°F, which equates to 107.1 ohms. Shorted circuits will reflect 0 ohms resistance. Open circuits will reflect infinite resistance. Therefore, fire-induced shorted and open circuits will result in the RTD circuit being eliminated from the bulk temperature calculation. In addition, any circuit upset that results in more than 37.3 ohms added to the circuit resistance will result in elimination of that circuit from the bulk temperature calculation. The value of 37.3 ohms reflects the circuit resistance change associated with an indicated 65°F to 240°F temperature rise.

The RTD circuits are three-wire compensated circuits. The compensation provided by the third wire eliminates field-wiring resistance as an input to the overall circuit resistance. Therefore, temperatures can be accurately measured in spite of fluctuations in wiring resistance. As cables exposed to heat increase in resistance, that change is compensated by virtue of the circuit design resulting in an undisturbed temperature indication up to the point of circuit failure. Cabling to the RTDs is shielded twisted wire, with grounded drain wire. A short to ground of only the compensating wire would result in a large resistance insertion that, in turn, would cause the RTD to be eliminated from the bulk temperature calculation. Shorts to ground of either signal wire would result in loss of signal and ensuing elimination of the affected RTD from the bulk temperature calculation. As noted in Reference 1, only one RTD of either division is required to support post-fire plant shutdown.

NRC Request #4:

Clarify the method which NMC used to measure distances, and provide a minimum distance or a tolerance for the separation of divisional equipment.

NMC Response:

As described in Reference 1, the Torus Compartment is approximately 37 ft high. For the purposes of this document and given the configuration of the Drywell and Suppression Pool, the Compartment is vertically subdivided as upper and lower portions with the Torus catwalk as the dividing point at approximately 26 ft off the floor. As discussed below, different measurement methods were used to determine separation between redundant function safe shutdown components depending upon locations within the Torus Compartment.

The first measurement method employed segmented straight-lines around the drywell and was used to determine separation between redundant Residual Heat Removal (RHR), redundant Core Spray valves and related cables. The valves and cables are completely contained on the "upper" level of the Compartment. Although the drywell interposes the space between redundant valves, there exist line of sight positions on the catwalk from which they may be viewed. Consequently, segmented straight-line measurements around the drywell taken from scaled drawings were used to determine separation distances between the valves. Part of the measuring process was to determine actual field location of the components and cables as accurately as possible via walk down. The segmented straight-line measurements around the drywell yielded the most conservative results.

In the second method, measurements of separation distances between redundant function instrumentation located on the "lower" level of the Torus Compartment were taken on an arc around the outside of the interposing Torus. The level instrumentation is mounted in a manner resulting in no direct line of sight between redundant components. In addition, structural supports and other commodities contribute to prevent a straight-line path underneath the Torus. Consequently, an arc was used as the measuring technique. As indicated in Reference 1, the separation between redundant Suppression Pool Level transmitters is 100 ft on an 89° arc. As indicated in the additional information section, the separation between redundant SPOTMOS conduit/cable exit points is 95 ft on an 84° arc.

Even if a straight line of sight path between the redundant level transmitters was assumed, the distance measured from a scaled drawing would be 90 ft. If the same approach is taken for SPOTMOS, the minimum separation straight-line distance between actual divisional cable exits measured from a scaled drawing is 89 ft. Both of these distances are greater than the distance between redundant RHR valves (85 ft) noted in Reference 1.

As a point of clarification, it should be noted that the systems discussed above operate independent of each other for the purpose of post-fire safe shutdown. For example, suppression pool level indication is not dependent on availability of SPOTMOS, or vice versa. Likewise, the RHR and Core Spray valves are not dependent upon each other, suppression pool level indication or SPOTMOS for fulfillment of their designated post-fire safe shutdown functions. Therefore, measuring the distance between redundant components is the correct technique for determining minimum separation in the Torus Compartment.

In Reference 1, measurements were noted as approximates. This was due to components being located in the plant, field measurements taken from landmarks and then the information transposed onto scaled drawings. Separation distances were then measured from the scaled drawings. The minimum separation distance identified was that between redundant RHR valves, 85 ft measured as described above. In order to provide a tangible separation distance from which to judge the appropriateness of the requested exemption and to avoid future confusion or questions regarding separation distances in the Torus Compartment, NMC is identifying 75 ft as the minimum separation distance between redundant function components/circuits. This distance is consistent with NRC approved precedent cited in Section E.2.b of Attachment 1 to Reference 1 (Page 1-11).

NRC Request #5:

Clarify the total amount of transient combustibles and/or heat release rate expected for the torus area, as discussed in Attachment 1, Section C, Item 5.a., "Type, Configuration and Quantity of Combustibles," of your September 15, 2003, letter. Please include information pertaining to prestaging for outages (especially storage of scaffolding).

NMC Response:

The Fire Protection Program permits the introduction of the equivalent of two gallons of general-purpose solvent into any area of the plant, including the Torus Compartment. Two gallons of general-purpose solvent is defined as equivalent to one cubic foot of wood (or 4' X 4' X ¾" sheet of plywood), both of which have a heat of combustion of 0.28 M BTU. If additional quantities of transient combustibles are introduced, the Fire Protection Engineer performs an analysis of the significance of the additional combustible load.

Three ladders are stored in the Torus Compartment and are classified as transient combustibles due to their portable nature. The combustible loading of the ladders along with the transient combustibles allowed by plant procedure results in an estimated "on-line" loading of 142 BTU/sq. ft. (1.7M BTU total), or an equivalent fire severity of less than 1 minute.

Pre-staging of other transient combustibles prior to outages is limited and dependent on the proposed work activities for the outage. The Updated Fire Hazards Analysis (UFHA) establishes the limits of combustible loading in the Torus Compartment. The amount of allowed transient combustibles that have been analyzed for the Torus Compartment is less than 1100 BTU/sq. ft. (12.4M BTU total), or an equivalent fire severity that remains less than 1 minute.

The scaffold control procedure requires a review by the Fire Protection Engineer if the amount of wood for a scaffold, or multiple scaffolds, exceeds one cubic foot. This review will determine if compensatory measures are required for the additional combustible load. Only metal scaffolding parts are stored in the Torus Compartment.

Additional Information

In the course of revising Figure 2, additional corrections and clarifications were made. First, the cables/conduits from TE-4079B and TE-4080B were removed from the conduit system associated with TE-4078B, TE-4077B, and TE-4076B. The revised route is via the conduit system associated with TE-4073B and TE-4074B. This change has no bearing on the Reference 1 discussions or the response to NRC Request # 3 above.

Second, the exit point of the Division I suppression pool temperature monitoring cables/conduits was moved 16 ft north of the "N" line as opposed to at the "N" line. This change modifies statements made in Attachment 1, Section C.4.c of Reference 1 as described below.

Attachment 1, Section C.4.c of Reference 1 states: *"Cables for each division* [SPOTMOS] *enter the Torus Compartment via separate chases approximately 100° (110 ft) apart."* and *"...the distance between divisional cable entries into the Torus Compartment (approximately 110 ft)."* By moving the exit point for the Division I cables/conduits 16 feet, the values in the statements referenced above change to *"...84° (95 ft) apart."* and *"...(approximately 95 ft)."* This change is of no significance as discussed in the response to NRC Request # 4 above.

References

1. NMC letter to NRC, "Exemption Request from the Requirements of 10 CFR 50, Appendix R Section III.G.2 for Fire Area IV/Fire Zone 1F - Torus Compartment," dated September 15, 2003.

ENCLOSURE 2

The following figures are attached:

Figure 1 (Rev. 1) – Torus Compartment Valves

Figure 2 (Rev. 1) – Torus Compartment Instruments

TORUS COMPARTMENT VALVES

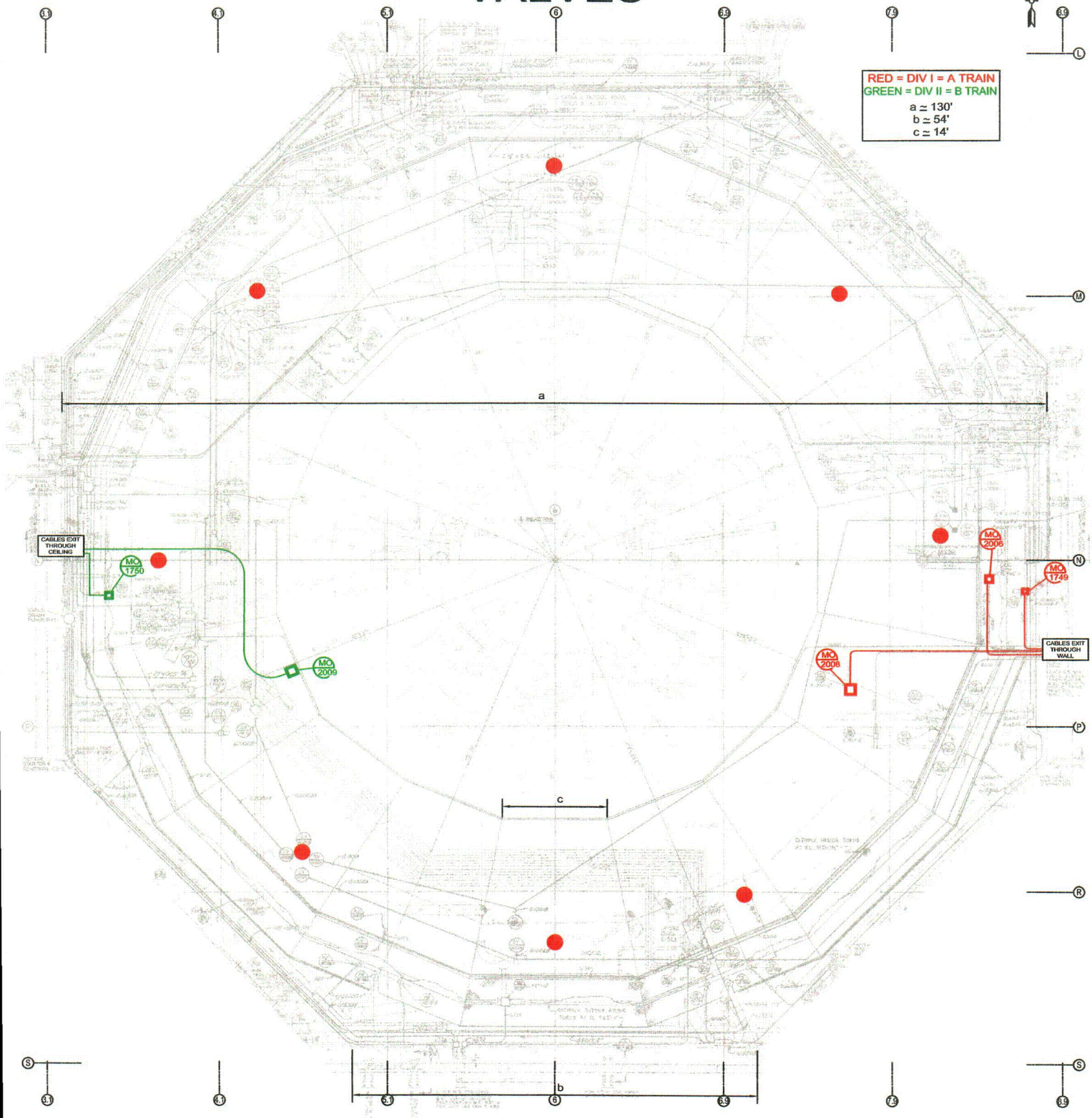

Figure 1 (Rev. 1)

Legend

● – SMOKE DETECTOR AT CEILING

Note: Not To Scale

C01

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TORUS COMPARTMENT INSTRUMENTS

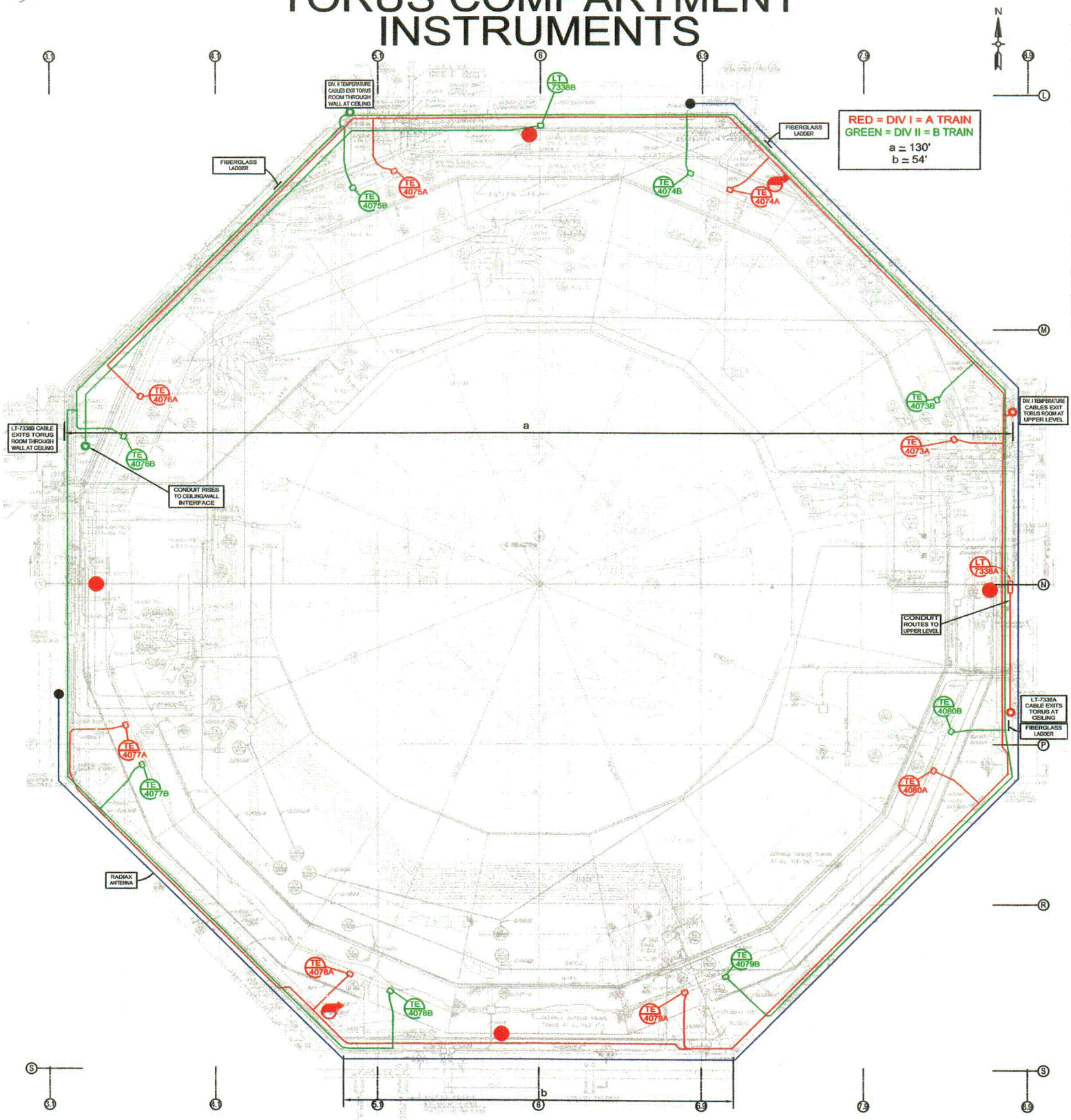

Figure 2 (Rev. 1)

Legend

– HOSE STATION

– SMOKE DETECTOR ON OUTSIDE WALL APPROX 16' ABOVE FLOOR

Note: Not To Scale

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