8.9 SAFETY SYSTEMS INDEPENDENCE CRITERIA AND BASES FOR ELECTRICAL CABLE INSTALLATION

Various criteria and bases establish the minimum requirements for preserving the independence of redundant reactor protection systems, engineering safety features systems, and Class 1E electrical systems through physical arrangement and separation, and assure necessary availability during any design basis event.

The electrical circuits associated with redundant or counterpart divisions, components, or subsystems of electrical systems important to safety are separated from each other by means of spacing or barriers or analysis to demonstrate functional redundancy (see Section 8.9.4). These electrical systems are designated as Class 1E systems, and include the Reactor Protection System (RPS), Primary Containment Isolation System (PCIS), the Neutron Monitor System (NMS) and the Engineered Safeguards System (ESS). The circuits associated with these Class 1E systems include their instrument signal circuits, their control circuits, and their power circuits.

A. Reactor Protection System (RPS)

The instrument signal circuits for the RPS are separated into four channels (A1, A2, B1, and B2), identified as Divisions IA, IIA, IB, and IIB, respectively. The manual signal circuits are separated into Channels A3 and B3, identified as Divisions IIIA and IIIB, respectively. The control and power circuits of the RPS are separated into two divisions, identified as Divisions A and B, with power and control Division A associated with signal Divisions IA, IIA, and IIIA, and power and control Division B associated with signal Divisions IB, IIB, and IIIB. Control and instrumentation of the RPS are described in FSAR Subsection 7.2.

B. Primary Containment Isolation System (PCIS)

Except as noted, control and power circuits for the inboard Primary Containment Isolation System valves are in Division I; similar circuits for the outboard valves are in Division II. Exceptions to this requirement are the RHR System I LPCI inboard injection valve, Reactor Water Cleanup outboard isolation valve, and the Main Steam Drain outboard isolation valve. Control and instrumentation of this isolation system are described in FSAR Subsection 7.3.

C. Engineered Safeguard System (ESS)

The separation concept places all electrical equipment of the ESS in either Division I or Division II. These two divisions include the electric power, control, and signal circuits for this equipment. The HPCI System, described in FSAR paragraph 6.4.1, has its associated electric circuits in Division II; (except for the inboard steam line isolation valve which is connected to Division I, see Section 8.9-B) and the

Automatic Depressurization System, described in FSAR paragraph 6.4.2, has its associated electric circuits in Division I. This depressurization system is a backup for the HPCI System and, thus, is a counterpart of the HPCI System.

The electric circuits associated with one of the two loops of the Core Spray System described in FSAR paragraph 6.4.3 are in Division I and the circuits of the other loop are in Division II. These respective divisions of electric circuits include the two pump motors and electrically-operated valves in each core spray loop.

The electric circuits associated with pumps A and C of the LPCI System, and their valves (described in FSAR paragraph 6.4.4), are in Division I; the electric circuits of pumps B and D, and their valves, are in Division II.

The circuits associated with the diesel generators, shutdown boards, and their interconnections are separated into eight groups of separation (four groups for Units 1 and 2 and four groups for Unit 3). The 480-V shutdown boards are separated from each other on a unit basis. Shutdown board 1A is separated from 1B, 2A from 2B, and 3A from 3B, with the ESS Division I loads supplied from boards A and ESS Division II from boards B. The 480-V reactor MOV boards are separated from each other on a unit basis. Reactor MOV board 1A and 1D are separated from 1B and 1E, etc. ESS Division I loads are supplied from reactor MOV boards 1A and 1D, while Division II loads are supplied from board 1B and 1E.

Essential common plant functions are divided into two redundant groups. These loads are connected to the diesel generator auxiliary boards and the control building vent boards. They are separated into two divisions for each function.

Refer to FSAR Figure 8.6-3 for the DC System separation.

8.9.1 Cable Insulation, Coatings, and Floor and Wall Penetrations

Cable insulation materials have been selected to minimize excessive deterioration due to temperature, humidity, and radiation during the design life of the plant. Insulation temperature ratings are such that the maximum normal ambient temperature plus any heat rise due to loading does not exceed the qualified temperature rating of safety-related cables.

The original ampacity of power cables in trays for all units was based on industry standards, such as Insulated Cable Engineers Association (ICEA) Standard P-46-426. A more recent publication, ICEA Standard P-54-440, incorporated the concept of uniform heating. A reevaluation of safety-related cables for Unit 2 and Unit 3 was performed based on ampacities from ICEA Standard P-54-440 and a conservative method of quantifying diversity which was inherent to ICEA Standard P-46-426 to ensure that the cables are not adversely affected by heating from adjacent cables.

Furthermore, evaluations have been performed on the safety-related cables in both conduits and trays for Unit 2 and Unit 3 to ensure that fire retardant coatings, fire wraps, installation configuration, and association with nonsafety cables do not adversely affect their current carrying capability.

Cables installed on cable trays pass the vertical flame test of Section 6.19.6 of ICEA Standard S-19-81. For plant areas containing safety-related equipment, the use of cables meeting only the minimum requirement of ICEA Standard S-19-81 requires a fire retardant cable coating (Flamemastic 77 or equal) on the cables' exposed surface in order to upgrade the effective flame retardancy to the ratings of IEEE 383-1974. Cables without certification to IEEE-383 or equal are coated with flame retardant material in accordance with the appropriate design criteria. Cables with certification to IEEE 383-1974 or equal flame retardant qualifications are not required to be coated, except at firestops. At fire barriers and pressure boundaries, any openings in the walls and floors for cable trays are sealed and the cables are coated with fire retardant cable coating. Conduit penetrations in walls and floors which form fire barrier compartmentation and/or pressure boundary are sealed. For the methods of sealing conduits and trays which penetrate fire barriers, refer to Figure 5.3.2 of the FSAR. Fire Protection is further discussed in Subsection 10.11.

Any exceptions to the above requirements will be documented as an exception to the appropriate design criteria.

8.9.2 <u>Raceways</u>

8.9.2.1 <u>General Plant Area</u>

Conduit was sized per TVA Electrical Standards Drawing 30A809 R0, 30A810 R0, and 30A811 R1 prior to 1976. The 40-percent maximum allowable cable fill expressed previously in the FSAR was an interpretation from the maximum allowable cable diameters given in the drawings. TVA Electrical Design Standard DS-E13.1.4 has been used since issued in 1976. This standard allows a maximum cable fill of 53-percent for 1 cable, 31-percent for 2 cables, and 40-percent for 3 or more cables. When the Electrical Standards Drawings were applied for conduit sizing, the resulting conduit fill limitations were essentially equivalent to the current Design Standard DS-E13.1.4. The Electrical Standards Drawings allowed a less conservative 32-percent maximum cable fill for 2 cables, however, the 1-percent difference is not considered significant based on cable and conduit tolerances. Conduits filled above DS-E13.1.4 levels are justified and documented as exceptions in the applicable Design Criteria.

There are five different raceway systems for voltage-level separation within a division. The are arranged as follows:

1. Medium Voltage Power (V5), Nominal Voltage 4160V AC

2. Low Voltage Power (V4), Nominal Voltage 480V AC and etc.

3. Control and Control Power (V3), Nominal Voltage 0-240V AC, 0-250V DC

4. Medium-level signal (V2), Nominal Voltage 100mV-250V AC or DC

5. Low-level signal (V1), Nominal Voltage 0-100mV AC or DC

In the appropriate design criteria, there is a tabulation of these voltage levels and the controlling factors in designing for installation within them. Cables are assigned voltage levels as listed above and routed in their appropriate respective raceway, unless specifically evaluated and documented as an exception to applicable design criteria. In addition, two permissible exceptions are defined below:

a. Cables of different voltage levels may be routed together in conduit when a piece of equipment has only one conduit opening. However, cables are separated with respect to voltage levels as soon as possible.

b. For designs and installations prior to July 31, 1987, when the circuit protective device in a radial feeder is capable of interrupting both the power and control circuits for a piece of equipment, the related power and control cables may be routed together in the same conduit.

Within a standard tray arrangement, normally, the minimum standard spacing between trays stacked vertically is 9 inches, tray bottom to tray bottom. The standard spacing between trays installed side by side is 4 inches, except this is 6 inches in the Cable Spreading Room. The trays are generally constructed of galvanized steel, 12 to 24 inches wide and 4 inches deep. Cable trays are generally designed for a loading of 75 lb/ft (including the weight of the tray), and trays in tiers carrying cables of redundant divisions have Category I seismic restraints and are separated as stated in paragraph 8.9.6.1, "Cable Routing." The structural integrity of the tray system is maintained through continued review of loading as new cables are added.

ESS cables are routed in Division I or II V5, V4, or V3 trays specifically marked for these cables. Cables for the RCIC System are routed in Division I trays and the cables for the HPCI System are routed in Division II trays.

The ESS Division I or Division II tray systems are shared across units with conduit ties between units to their respective tray system. Examples of shared systems are the SGTS, EECW and RHR Service Water Systems. Cables for these redundant systems are routed in Division I or Division II trays and/or conduits.

Power cables from each diesel generator to its respective 4160-V shutdown board, bus 1 and bus 2 interties, are installed in separate conduits. The power cables from the 4160-V shutdown boards to the respective transformers for the 480-V shutdown boards and the 480-V diesel auxiliary boards are installed in raceways (conduit or cable tray) which assure adequate physical separation.

The normal DC supplies to the 4160-V shutdown board control bus are routed in raceways separate from the alternate DC supplies to these boards. The normal DC feeders to the 480-V shutdown board control bus are in separate raceways from the alternate DC feeders.

The normal and alternate supplies to the 250-V DC MOV boards are routed separately such that neither is in the same raceway. Generally, the normal or alternate supply to each MOV board is installed in conduit.

A nonsafety-related cable may be routed in a raceway with safety-related cables, but once mixed with one of the redundant divisions, it must continue in that division and not cross over and be mixed with the other redundant division.

Nonsafety-related circuits shall be considered mixed with redundant safety-related divisions if they receive power from one division and share an enclosure or raceway with a redundant division. Exceptions are allowed for nonsafety-related power cables to share a power supply and enclosure with one safety-related division and an enclosure or raceway with the other safety-related division if the circuit is provided with protection consisting of two safety-related electrical protection devices in series to prevent it from degrading safety-related circuitry. Exceptions are also allowed for nonsafety-related instrumentation and low-voltage control circuitry to mix with both safety-related divisions when analyses demonstrate the absence of adverse interactions between safety-related circuitry and associated nonsafety-related circuits. Special exceptions are also discussed in Section 8.9.4.1.

Cable trays for safety-related cables shall have a minimum horizontal separation of 3 feet between trays containing cables of different divisions. If 3-foot separation is not attainable, a fire-resistant barrier is required, extending at least 1 foot above (or to the ceiling) and 1 foot below (or to the floor) line-of-sight communication between the redundant trays.

Vertical stacking of cable trays of redundant divisions is avoided where practical. Where vertical stacking of redundant trays is not avoidable, there is a minimum vertical separation of 5 feet. If the five feet vertical separation between vertically stacked redundant tray systems is not attainable, a fire barrier is required.

In congested areas, where one redundant tray system crosses over a tray or panel of the other system, there is a minimum vertical separation of 18 inches (tray bottom

to tray bottom) with an acceptable barrier between the redundant tray systems for a distance of 5 feet on each side of the intersection.

Trays containing nondivisional cables are routed within the 3-foot minimum horizontal space between trays of Divisions I and II. However, there are locations within the Reactor and Control Buildings where a nondivisional tray may be routed parallel first to one divisional tray and then parallel to the other divisional tray. An example of this occurs when the divisional trays are at the same elevation, but are end-to-end rather than parallel. (There is a minimum space of 3 feet between the ends of the divisional trays.) A nondivisional tray could run alongside the first divisional tray to the 3-foot space between the ends of the two divisional trays and then continue alongside the second divisional tray. Nondivisional trays are spaced a minimum of 4 inches horizontally (6 inches in the Cable Spreading Room, see FSAR Section 8.9.2.2) and a minimum of 9 inches vertically from divisional trays. The structural integrity of the tray system is maintained through continued review of loading as new cables are added.

8.9.2.2 Cable Spreading Room

Where cables of different divisions of separation are run from the same or adjacent control panels with spacing less than the 3-foot minimum, both cables are run in metal (rigid or flexible) conduit to a point where a 3-foot separation exists.

A minimum horizontal separation of 3 feet is required between trays containing cables of different divisions of separation, if no physical barrier exists between trays. If a horizontal separation of at least 3 feet cannot be attained, a fire-resistant barrier is required, extending at least 1 foot above (or to the ceiling) and 1 foot below (or to the floor) line-of-sight communication between the two tray systems. Vertical stacking of trays carrying cables of different divisions is avoided.

In the case of crossing of a tray of one separation division over a tray of the other division, there is a minimum vertical separation of 18 inches (tray bottom to tray bottom) with an acceptable barrier between the redundant tray systems for a distance of 3 feet on each side of the intersection.

Non-divisional trays are spaced a minimum of six inches horizontally and a minimum of nine inches vertically (tray bottom to tray bottom) from divisional trays.

8.9.3 Containment Penetration

Cables through drywell penetrations are so grouped that failure (open circuits, shorts, or grounds) of all cabling in a single penetration cannot prevent a scram. (This applies specifically to the neutron monitoring cables and the main steam isolation valves position switches.)

Low-voltage power and control cables for the ESS Division I and the RPS channels IA and IB are routed through three penetrations (EA, EB, and EC), with RPS channel IA in EC and RPS channel IB in EB. These three penetrations are located on the southwest side of the primary containment.

Low-voltage power and control cables for ESS Division II and RPS channels IIA and IIB are routed through two penetrations (EE & EF), with RPS channels IIA and IIB in penetration EE. These two penetrations are located on the northeast side of the primary containment.

8.9.4 Control Room and Local Panels

No single control panel, local panel, or instrument rack includes wiring essential to the protective function of both redundant systems, which are backups for each other (Division I and Division II), except where, for operational reasons, locating manual control switches on separate panels is considered to be prohibitively (or unduly) restrictive to normal functioning of equipment; the switches may then be located on the same panel, provided no single event in the panel can defeat the automatic operation of the equipment. If this protection cannot be provided by circuit design (i.e., principles of fault-resistant circuit design and functional redundancy analysis to satisfy the single failure requirement), the switches for controlling different divisions of subsystems are grouped in subpanels separated by fire-resistant separation barriers without penetrations that could propagate a fire between subpanels.

8.9.4.1 Spacing of Wiring and Components in Control Boards, Panels and Relay Racks

A minimum distance of 6 inches, or barriers between wiring and components in control boards, panels, and relay racks, preserves the independence of Divisions I and II circuits. Except in a few instances, the two divisions are on separate panels which themselves are separated from other panels by metal barriers or by distance. There is no requirement to separate or use barriers between devices or wiring of the same division within the confines of a given panel.

Redundant systems for isolating the containment are divided into Division I and Division II, with separation or barriers as noted above. However, there is an exception to the use of separation or barriers between some of the redundant equipment on panels 25-7A and 25-7B. The two high-flow differential pressure transmitters that produce signals for isolating the steam lines to the RCIC turbine are mounted side-by-side on panel 25-7A and the two for the HPCI turbine are mounted similarly on panel 25-7B. This exception is acceptable because the high-temperature detectors along the steam lines provide a diverse redundant means for initiating the isolation signals. These high-temperature detectors provide coverage of the entire spectrum of sizes of steam line breaks and, thus, are the primary detectors of a break. The two divisions of high-temperature signal circuits

for the RCIC turbine are separated from each other, and those of the HPCI turbine are also separated from each other. In addition, the RCIC signal circuits are separated from those of the HPCI. This separation prevents a single credible event from effecting both high-temperature isolation signals for either turbine.

There are special cases in the control room where nonsafety- related wiring from panels containing one division of equipment is routed into a tray with wiring from panels containing the other division. This is acceptable because:

1. if the cables of interest do not leave the control bay, then the back up controls would not be effected by such a coupling and could be used in safely shutting down the plant, or

2. if the cables do leave the control bay, they have been shown to have adequate fault protection (fuse/breaker) to prevent the propagation of the fault.

Where the above separations cannot be met within the auxiliary instrument room panels, Division I cables may be run adjacent to Division II cables provided an analysis is performed and documented to show that plant safety is not jeopardized (i.e., redundant safe shutdown features/functions are not jeopardized).

8.9.5 Separation of Class 1E Electrical Equipment

4160-V Diesel Generators A, B, C, D, 3EA, 3EB, 3EC, and 3ED

4160-V diesel generators A, B, C, and D are located in Unit 1-2 Diesel Generator Building on El. 565.5 in individual rooms. Diesel generators 3EA, 3EB, 3EC, and 3ED are located in Unit 3 Diesel Generator Building on El. 565.5 in individual rooms. The layout of these rooms is shown in Figures 1.6-26 and 1.6-27 of the FSAR.

4160-V Shutdown Boards A, B, C, D, 3EA, 3EB, 3EC, and 3ED

Boards A, B, C, and D are located in separate rooms in the Reactor Building. Boards A and C are located on El. 621.25 and boards B and D are located on El. 593. The layout of these rooms is shown in Figures 1.6-3 sheets 1 and 2 and 1.6-5 of the FSAR.

Boards 3EA, 3EB, 3EC, and 3ED are located in separate rooms in the Unit 3 Diesel Generator Building. Boards 3EB and 3ED are located on El. 565.5 and boards 3EA and 3EC are located on El. 583.5. The layout of these rooms is shown in Figure 1.6-27 of the FSAR.

<u>4160/480-V Shutdown Board Transformers TS1A, TS1B, TS1E, TS2A, TS2B, TS2E, TS3A, TS3B, and TS3E</u>

Transformers TS1A and TS1B are located outside the 480-V shutdown board rooms 1A and 1B on El. 621.25, and TS1E is located on El. 639.0 in the Reactor Building, Unit 1. Transformers TS2A, TS2B, TS2E, TS3A, TS3B, and TS3E are located similarly in Units 2 and 3, respectively.

<u>480-V Shutdown Boards 1A, 1B, 2A, 2B, 3A, and 3B</u>

Each of these boards is located in a separate room in the Reactor Building on El. 621.25. The layout of these rooms is shown in Figures 1.6-3 sheets 1 and 2 and 1.6-12 of the FSAR.

<u>480-V Reactor MOV Boards 1A, 1B, 1C, 1D, 1E, 2A, 2B, 2C, 2D, 2E, 3A, 3B, 3C, 3D, and 3E</u>

All of this equipment is located in the Reactor Building. Boards 1A, 1B, 2A, and 2B are located in the rooms with the 4160-V shutdown boards. Unit 3 boards 3A and 3B are located in individual rooms on El. 621.25 and El. 593. Boards 1C, 2C, and 3C are on El. 565. The layout of these rooms is shown in Figures 1.6-3 sheets 1 and 2, 1.6-5, 1.6-6, and 1.6-13 of the FSAR.

<u>480-V Control Bay Vent Boards A, B</u>

Boards A and B are located on El. 606 of the control bay. Board A is located in the Mechanical Equipment Room in the Unit 1 area, and board B is located in the Cable Spreading Room in the Unit 3 area. This provides two independent zones. The layout of these rooms is shown in Figures 1.6-4 and 1.6-12 of the FSAR.

<u>4160/480-V HVAC Board Transformer THB</u>

Transformer THB is also located on El 621.25 in the Unit 3 Reactor Building. Layout of this area is shown in Figure 1.6-12 of the FSAR.

<u>480-V HVAC Board B</u>

This board is located in the Unit 3 reactor building, elevation 593' electrical board room with 480-V reactor MOV board 3B. The layout of this room is shown in Figure 1.6-13 of the FSAR.

4160/480-V Diesel Auxiliary Board A and B Transformers TDA, TDB, and TDE

Transformers TDA and TDB are located on El. 583.5 of the Units 1 and 2 Diesel Generator Building, and TDE is located on El. 565.5 of the same building. These locations are shown in Figure 1.6-6 in the FSAR.

480-V Diesel Auxiliary Boards A, B, 3EA, and 3EB

Boards A and B are located in individual rooms on El. 583.5 in the Unit 1 and 2 Diesel Generator Building. The location of these boards is shown in Figure 1.6-6 of the FSAR. Boards 3EA and 3EB are located in individual rooms on El. 583.5 in the Unit 3 Diesel Generator Building. The location of these boards is shown in Figure 1.6-27 of the FSAR.

125-V Diesel Generator Batteries A, B, C, D, 3A, 3B, 3C, and 3D

Batteries A, B, C, and D are located in individual rooms on El. 565.5 of the Unit 1 and 2 Diesel Generator Building in the room with the diesel generator. The layout of these rooms is shown in Figure 1.6-26 of the FSAR.

Batteries 3A, 3B, 3C, and 3D are located in individual rooms on El. 565.5 of the Unit 3 Diesel Generator Building in the room with the diesel generator. The layout of these rooms is shown in Figure 1.6-27 of the FSAR.

250-V Battery Boards 1, 2, and 3

These boards are in individual rooms on El. 593 of the control bay. The location of these rooms is shown in Figures 1.6-5 and 1.6-13 of the FSAR. The battery board room number is the same as the board it contains.

250-V DC Reactor MOV Boards 1A, 1B, 1C, 2A, 2B, 2C, 3A, 3B, and 3C

All of these boards are located in separate rooms within the Reactor Building. Boards 1A, 1B, 2A, and 2B are located in the rooms with the 4160-V shutdown boards. Unit 3 boards, 3A and 3B, are located in individual rooms on El. 621.25 and El. 593, respectively. Boards 1C, 2C, and 3C are not in individual rooms, but the boards for the other two power channels associated with each reactor are located in individual rooms providing three independent zones. Boards 1C, 2C, and 3C are on El. 565. The layout of these rooms is shown in Figures 1.6-3 sheets 1 and 2, 1.6-5, 1.6-6, 1.6-12, and 1.6-13 of the FSAR.

8.9.6 Cable Routing

For 4160-V (V5), 3-phase, AC cable (greater than No. 2/0), the initial concept was to install these cables in V5 cable trays in triangular groupings with a minimum spacing

equal to the radius of the larger cable. After issuance of Design Standard DS-E12.6.3 for ampacity (September 2, 1986), the separation required was identified as 1/4 the overall effective diameter of the larger of the grouped 3-phase circuits. As a result of the May 1975 fire recovery plan, Flamemastic was placed over the cables in divisional trays; making measurement of the spacing between previously-installed cable groups no longer feasible and prohibiting free air flow between cable groupings. For installed safety-related cable, it is assumed conservatively that the cables are not uniformly spaced but are randomly laid in the tray. For installation of new V5 cables, spacing shall be maintained at 1/4 the overall effective diameter of the larger of the grouped 3-phase circuits.

For V4 cable trays, all low-voltage power cables scheduled after July 1, 1988, may be multiconductor (in order to provide a higher allowable ampacity for the respective conductor size) or single conductor (to meet any restrictions on bend radius requirements) when routed on a V4 cable tray. Previous designs with a No. 2 AWG or smaller cable were restricted to multiconductor cables only.

Cable tray fill is dictated by limits on the structural capability of the tray system and, in addition, for V4 and V5 trays ampacity considerations. Structural integrity is maintained through continued review of loading when new cables are added. Ampacity of additional cables is reviewed to ensure depth of cable in tray does not adversely affect capability to carry its required load current.

8.9.6.1 Class 1E Cables

Inside and outside the containment area, cables for the RPS outside the main protection system cabinets are installed in rigid conduit used for no other wiring. Under vessel neutron monitoring cables are exempted from this requirement because of space limitation and the need for flexibility on the intermediate range monitoring (IRM) cables.

Cables for sensors of more than one variable in the same trip channel may be installed in the same conduit. Cables from both RPS trip system actuators to the scram solenoids for a single rod group may be installed in a single conduit. However, a single conduit shall not contain cables to more than one group of scram solenoids. Cables for two solenoids on the same control rod may be installed in the same conduit.

Cables for the ESS are separated into redundant divisions (Division I or Division II) such that no single credible event could damage the cables of the redundant counterparts.

The routing of safety related cables through missile or hostile environmental areas is generally avoided. In rooms or compartments having rotating heavy machinery, such as the reactor recirculating pump M-G sets and the reactor feedwater pumps,

or in rooms containing high-pressure feedwater piping or high-pressure steam lines, sufficient physical distance separation or a protective barrier to prevent damage to cables in both divisions is provided between trays containing cables of different divisions of separations. Inside the primary containment area, all ESS Division II cables are installed in conduit only. The ESS Division I cables are installed in cable trays and conduits.

The routing of safety related cables through rooms or spaces where a fire hazard exists, such as the potential for accumulating large quantities of oil or other combustible materials, is generally avoided. In cases where it is impossible to provide other routing, only one division of redundant cables is allowed in any such area.

8.9.7 Fire Detection and Protection

Fire Protection is further discussed in Subsection 10.11.

8.9.8 Conduit Cable and Cable Tray Markings

Cables and their associated raceway are tagged to have their appropriate division of separation identified. Exceptions to these markings will be identified as appropriate.

Cable trays are identified with block letters on a colored background located on the side of the cable tray. Safety-related and non-safety cable trays are distinguishable by a different colored background.