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**John C. Stennis Space Center**  
Stennis Space Center, MS  
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**SCWI-8715-0012 Rev. B**  
**February 2021**

## **John C. Stennis Space Center**

### **Work in Hazard Classification Areas**

*Original Signature on File*

*04/27/2021*

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Gary L. Benton  
Director, Safety and Mission Assurance Directorate

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Date

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## Document History Log

Status/ Change/ Revision	Change Date	Originator/Phone	Description
Basic	04/20/09	Robert F. Gargiulo, x8-3842	Initial Release.
Rev A.	05/31/12	Robert F. Gargiulo, x8-3842	Revised to remove all references to the Hardware Assurance Test Contract (HATC). The HATC contract no longer exists.
Rev A.1	04/03/2014	S. Woolridge	Admin changes
Rev A-2	07/15/2016	Robert F. Gargiulo, x8-3842	Administrative changes. Removed references to FOSC, TOC, ITSC. Removed SPR 8715.3 Hot Work Permit Program, which was cancelled.
Rev A-3	02/27/2017	Rachel Harrison-Woodard x8-1682	Administrative changes, updated NFPA 55 & NPR 1441.1 document titles. Deleted reference ASTM 03-704097-31, obsolete.
Rev B	1/10/2020	Robert Simmers x8-1877	Incorporated Appendix A for evaluation of Portable Electronic Products per ANSI/ISA-12.12.03-2011. Revised acronyms and abbreviations.

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## 1.0 PURPOSE

This John C. Stennis Space Center (SSC) Common Work Instruction (SCWI) defines the processes and procedures for performing work and operations in hazardous classification areas at SSC.

## 2.0 APPLICABILITY

This SCWI applies to all NASA, NASA Direct Contractor and NASA Direct Construction Contractor operations at SSC.

## 3.0 DOCUMENT CONTROL

This SCWI shall be updated and maintained in accordance with SPR 1400.1, *Document Preparation, Numbering, and Management*.

## 4.0 REFERENCES AND APPLICABLE DOCUMENTS

All references are to be the latest version unless otherwise specified.

- a. ANSI/ISA-TR12.6, *Wiring Practices for Hazardous Classified Locations Instrumentation*, 1995
- b. ANSI/ISA-12.12.01, *Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Division 1 and 2 Hazardous (Classified) Locations*
- c. ANSI/ISA-12.12.03-2011 *Standard for Portable Electronic Products Suitable for Use in Class I and II, Division 2, Class I Zone 2 and Class III, Division 1 and 2 Hazardous (Classified) Locations*
- d. ASTM Manual 36, *Safe Use of Oxygen and Oxygen Systems: Handbook for Design, Operation, and Maintenance*
- e. NFPA 30, *Flammable and Combustible Liquids Code*
- f. NFPA 53, *Recommended Practice on Materials, Equipment, and Systems Used in Oxygen-Enriched Atmospheres*
- g. NFPA 55, *Compressed Gases and Cryogenic Fluids Code*
- h. NFPA 70, *National Electric Code*
- i. NFPA 496, *Standard for Purged and Pressurized Enclosures for Electrical Equipment*

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- j. NFPA 497, *Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*
- k. NPR 1441.1, *NASA Records Management Program Requirements*
- l. NPR 7123.1, *NASA Systems Engineering Processes and Requirements*
- m. NPR 8715.3, *NASA General Safety Program Requirements*
- n. SCWI-8838-0002, *SSC Hot Work Program*
- o. Form SSC-68, *Flame "Hot Work" Permit*
- p. SPR 1400.1, *Document Preparation, Numbering, and Management*
- q. SPR 1440.1, *Records Management Program Requirements*
- r. SPR 8715.1, *John C. Stennis Space Center Safety and Health Procedures and Requirements*
- s. SREF-8060-0003, *NASA SSC Engineering & Test Directorate (E&TD) Electrical Design and Operations Guide for Classifying Hazardous Locations and for Electrical Equipment and Wiring in Classified Locations*
- t. Electrical Hazardous Classification drawings (series 21000)
- u. IEEE Paper PCIC-4, "Cellular Phones in Class I, Division 2/Zone 2 Hazardous Locations", Bozek, A., Martin K., and Cole, M.

## 5.0 RESPONSIBILITIES

Responsibilities are as follows:

- a. SSC Safety and Mission Assurance Directorate (SMA) shall establish processes and procedures to ensure work in hazardous classification areas is performed in a safe manner to protect the workers and facilities.
- b. The Center Operations Directorate and the Engineering & Test Directorate shall:
  - (1) Ensure systems are properly classified.
  - (2) Ensure all NASA SSC civil service employees and NASA SSC contractors abide by the requirements within this work instruction.

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c. NASA Direct Contractor organizations are responsible for abiding by the requirements of this work instruction. All NASA SSC Direct Contractor organizations shall develop written processes and procedures for work in hazardous classification areas for their operations and operations of their contracted efforts.

## 6.0 PROCEDURES

### 6.1 Categories of Work

Work in hazardous classification areas fall within three categories:

a. Hot Work: Work in which arcs, heat, sparks, and/or flames are intentionally used or produced as part of the work/process. Hot work shall be governed by SCWI-8838-0002, *Hot Work Program Procedure*.

b. Safe Work: Work in a hazardous classification area with tools or operations that are intrinsically safe or rated for the specific hazardous classification. It also includes work in which no sources of arc, heat, sparks and/or flames are generated or would potentially be present. This would include Portable Electronic Products (PEPs) evaluated and approved for use in specific hazardous classification areas. Safe work may be performed with no special controls or procedures related to the hazardous classification area.

c. Controlled Work: Work in a hazardous classification area with tools or equipment that are not intrinsically safe and/or are unrated for the specific environment. Such tools and equipment may include non-spark resistant tools and/or unapproved PEPs (i.e. cameras, computers, and other electronic devices), which may produce heat or sparks unintentionally. Special procedures or controls are necessary to ensure the area, processes, and operations are safe as outlined in this SCWI.

### 6.2 Determination of the Location Classification

a. Prior to commencing any work or operations with equipment that may intentionally or unintentionally produce sparks, flames, or heat, the hazardous classification of the location/area of work shall be determined.

b. The hazardous classification shall be in accordance with NFPA 497 and NFPA 70. For reference, see SREF-8060-0003 and the Electrical Hazardous Classification drawings (series 21000).

### 6.3 Process Controls

For hazardous classification areas, Safe Work may be performed with no special controls or processes. Hot Work will be performed in accordance with SCWI-8838-0002 or the contractor-approved program. Tools, equipment and processes appropriately rated for work in the

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hazardous location will be selected and used. Where this is not possible, the work must be classified as Controlled Work and the following controls shall be implemented as a minimum:

- a. Initial Atmospheric Check: An initial atmospheric check for flammable or combustible gases and/or vapors shall be made with a properly calibrated meter and/or fixed sensor or detector. If the meter is not specific to the gas or vapor in question, the operator will determine the proper response factor and adjust the meter readings as appropriate. If the portable meter or fixed sensor/detector(s) indicates any flammable/combustible readings, the operations will not commence until the source of the reading is identified (e.g. leak, meter drift/fault) and corrected, and/or an evaluation of the safety of the operation is made.
- b. Continuous Atmospheric Check: Throughout the Controlled Work operation, continuous atmospheric monitoring shall be performed to detect leaks or a change in conditions. Continuous monitoring may be achieved by one or more of the following three means:
  - (1) Personnel monitors – the personnel performing the work may wear personal detection monitors or carry gas detection meters suited for the specific flammable/combustible material in question. Personnel shall terminate operations and move to a safe location outside of the hazardous classification area at any detection of gases/vapors. Controlled Work will only commence again once the source of gas/vapor is corrected or the cause of the reading is determined, and the operation is deemed safe to proceed.
  - (2) Area monitors – a properly calibrated meter placed between the most probable source of gas/vapor and the Controlled Work. If any reading on an area sensor/detector is experienced, personnel shall terminate operations and move to a safe location outside of the hazardous classification area. Controlled Work will only commence once the source of the gas/vapor is corrected or the cause of the reading is determined, and the operation is deemed safe to proceed.
  - (3) Point source detection – if the hazardous classification area is equipped with gas/vapor detection equipment with an audible alarm at the potential point source for flammable/combustible material leaks, this system may be used to perform continuous monitoring. A prime example is a properly calibrated hydrogen gas detection sensor located over a potential leak source such as a valve or instrument assembly. If the audible alarm is initiated, personnel shall terminate operations and move to a safe location outside of the hazardous classification area. Controlled Work will only proceed once the source/cause of the reading is identified and corrected, and the operation is deemed safe to proceed.

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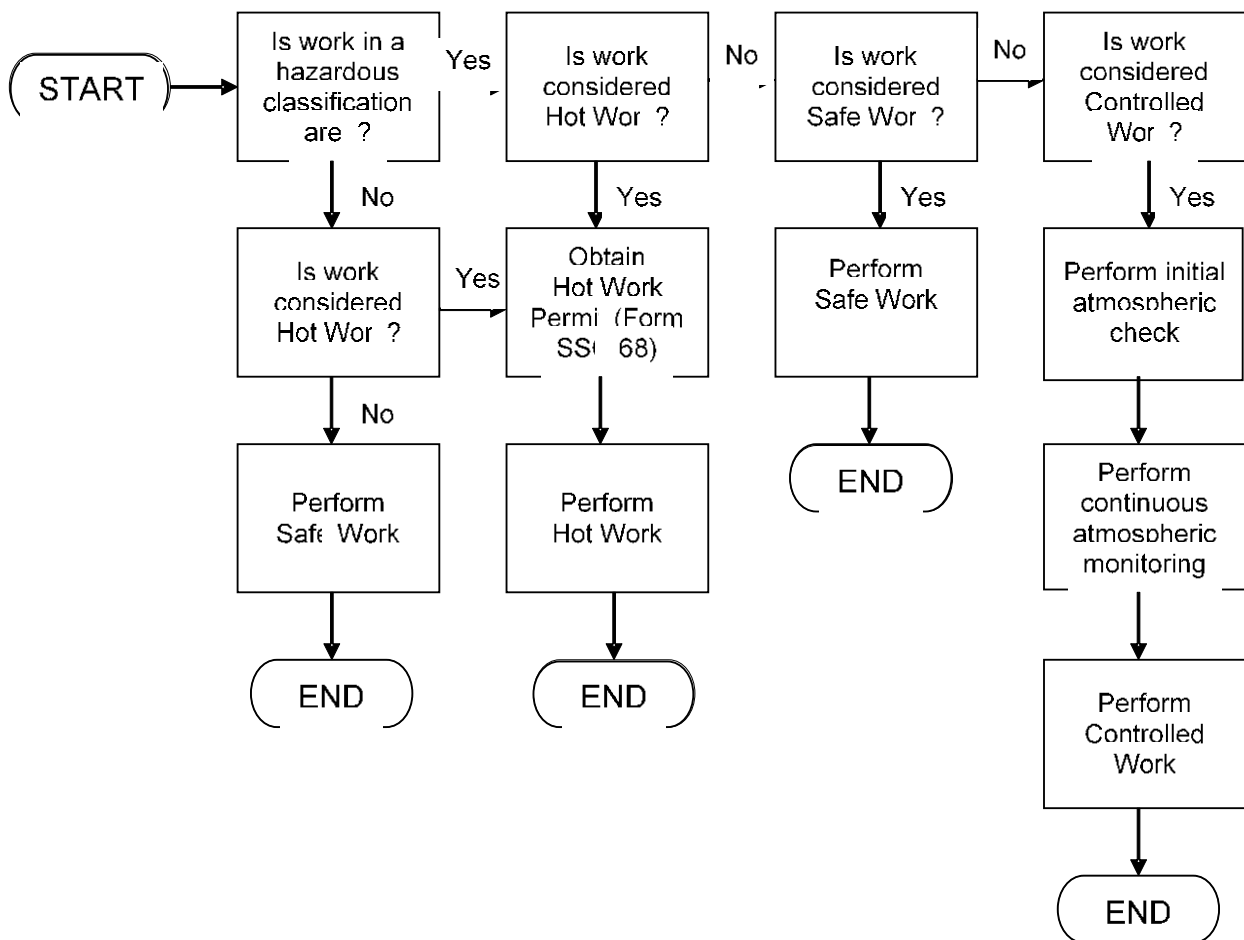
## 6.4 Process Flow

Figure 1 illustrates the overall process for work in hazardous classification areas.

**Figure 1.** Process Flow for Work in Hazardous Classification Areas

## 7.0 RECORDS AND FORMS

Records generated by this SCWI shall be maintained in accordance with applicable requirements of SPR 1440.1. All records and forms are assumed to be the latest version unless otherwise indicated. Quality Records are identified in the SSC Master Records Index.





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## 8.0 ACRONYMS, ABBREVIATIONS, AND DEFINITIONS

### 8.1 Acronyms and Abbreviations

ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
ETD	Engineering and Test Directorate
NASA	National Aeronautics and Space Administration
NFPA	National Fire Protection Agency
NPR	NASA Procedural Requirements
PEP	Portable Electronic Product
SMA	Safety and Mission Assurance Directorate
SCWI	John C. Stennis Space Center Common Work Instruction
SREF	System Design Reference
SPR	John C. Stennis Space Center Procedural Requirements
SSC	John C. Stennis Space Center

### 8.2 Definitions

**Approved Personal Electronic Product (PEP)** – A personal electronic product (see definition below) which has been evaluated and approved in accordance with Appendix A of this Stennis Common Work Instruction and on-line “Portable Electronic Product Evaluation Request” by the organizations and personnel having responsibility and authority for approving PEPs for use in a hazardous classification area(s). If approved, approval is for a specific make, model and configuration as identified on the on line “Portable Electronic Product Evaluation Request”.

**Class I, Division 1 (Class I Div. 1) Location** - An area:

- In which ignitable concentrations of flammable gases or vapors can exist under normal operating conditions, or
- In which ignitable concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage, or
- In which breakdown or faulty operation of equipment or processes might release ignitable concentrations of flammable gases or vapors and might also cause simultaneous failure of electrical equipment in such a way as to directly cause the electrical equipment to become a source of ignition.

**Class I, Division 2 (Class I Div. 2) Location** - An area:

- In which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems or in case of abnormal operation of equipment, or
- In which ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operation of the ventilating equipment, or

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c. That is adjacent to a Class I, Division 1 location, and to which ignitable concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air and effective safeguards against ventilation failure are provided.

**NOTE:** In layman terms, the area classifications may be described as follows:

- **Class 1, Div. 1** - Where ignitable concentrations of flammable gases, vapors, or liquids can exist all of the time or some of the time under normal operation conditions.
- **Class 1, Div. 2** - Where ignitable concentrations of flammable gases, vapors, or liquids are not likely to exist under normal operating conditions.
- **Class 2, Div. 1** - Where ignitable concentrations of combustible dusts can exist all of the time or some of the time under normal operation conditions.
- **Class 2, Div. 2** - Where ignitable concentrations of combustible dust are not likely to exist under normal operating conditions.
- **Class 3, Div. 1** - Where easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.
- **Class 3, Div. 2** - Where easily ignitable fibers are stored and handled.

**Explosion-Proof Products:** Products capable of containing an explosion. The term "explosion-proof" does not indicate that the product is capable of withstanding an external explosion, but only of withstanding an internal explosion without allowing flames or hot gases to escape from the housing to trigger an explosion in the surrounding atmosphere. The "explosion-proof" term is assigned to those products which are certified by the national rating agencies such as Underwriters Laboratories and Factory Mutual Research after meeting their specifications and passing their tests. Unless certified by one of these agencies, the product does not meet the "explosion-proof" requirements of the National Electrical Code.

**Intrinsically Safe:** ANSI/ISA RP12.6-1995 defines intrinsically safe equipment as, "equipment and wiring which is incapable of releasing sufficient electrical or thermal energy under normal or abnormal conditions to cause ignition of a specific hazardous atmospheric mixture in its most easily ignited concentration." Intrinsically safe products receive their classification because their electrical power usage is below the level of power required to set off an explosion within a given hazardous area.

**Hazardous Classification Rated Equipment:** Equipment that either:

- Is intrinsically safe and is labeled as such by the Underwriters Laboratory, or
- Meets the NFPA 70, *National Electric Code*, requirements for a particular Class, Group, and Division for the location it is used in, or
- Meets the 'Purged and Pressurized' definition in NFPA 70, Article 500.2. NFPA 70 refers to NFPA 496 Standard for Purged and Pressurized Enclosures for Electrical Equipment for detailed purging requirements.

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**Non-Hazardous Classification Rated Equipment:** Equipment that has not been labeled or designated as:

- a. Meeting the NFPA-70 requirements for a particular Class, Division and Group, or
- b. Intrinsically safe per the Underwriters Laboratory and does not meet the NFPA 70 and NFPA 496 purge requirements.

**Portable Electronic Product (PEP):** a battery powered or photovoltaic cell powered apparatus that can be hand-held or that is intended for use while worn on a person's body. A PEP shall meet the following criteria:

- a. No available listed apparatus suitable for the area classification and capable of performing the intended function
- b. Limited radio frequency energy transmission. The radiated radio frequency (9 kHz to 60 GHz) energy from a portable electronic product is not considered an ignition source if the power is equal to or below the following limits:
  - 2 W maximum output averaged over 20 microseconds for Groups A & B and Group IIC
  - 3.5 W maximum output averaged over 80 microseconds for Group C and Group IIB
  - 6 W maximum output averaged over 100 microseconds for Group D and Group IIA
  - 6 W maximum output averaged over 200 microseconds for Class II, Class III, or Zone 22 hazardous (classified) locations.
- c. No provisions for forced ventilation
- d. No sparks visible in normal operation
- e. No excessive temperatures in normal operation
- f. No camera flash unless it can be disabled
- g. No motors unless it can be demonstrated the motor incorporates non-arcing technology
- h. No visible damage

**PEP 1:** A body-worn portable electronic product, in direct contact with the skin, deemed incapable of causing an ignition under normal conditions:

- a. Powered by a maximum of two button cells
- b. Body-worn and in direct contact with the skin
- c. No electrical connections accessible outside the product

Examples are electronic wristwatches and hearing aids that are inserted into the ears.

**PEP 2:** Portable electronic product deemed incapable of causing an ignition under normal conditions

- a. Powered by one or more cells, batteries, or photovoltaic cells.
- b. Cell or battery secured so it will not fall out in the drop test (2 meter drop).
- c. Body-worn or hand-held.
- d. No external electrical connections or wired accessories are used in the hazardous (classified) location. NOTE Bluetooth headset is an example of a non-wired accessory.

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- e. Exposed terminals (i.e. battery charging terminals) are either recessed or diode protected to prevent a discharge caused by an accidental shorting of these terminals.
- f. Power switch – Any product with a power on-off switch with contacts that directly interrupt battery current is not acceptable for PEP 2 because the switch may cause an ignition-capable arc.
- g. No damage that exposes the electrical/electronic circuitry as a result of the drop test (2 meters/ 6’6” onto concrete)

Examples are some calculators, some medical injection devices, electronic watches with Calculators, some cell phones, tablets, barcode scanners etc. See Appendix B for a list of typical PEP 2 which may be approved for use in hazardous classification areas.

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## APPENDIX A: Portable Electronic Products

### 1.0 PURPOSE:

This Appendix to SCWI-8715-0012 “Work in Hazardous Classification Areas” defines the process and procedure for assessing the potential use of Portable Electronic Products (PEP) for work and operations in hazardous classification areas at SSC.

### 2.0 APPLICABILITY

This Appendix applies to all NASA, NASA Direct Contractor and NASA Direct Construction Contractor operations at SSC who use portable electronic products in hazardous classification areas.

### 3.0 REFERENCES AND APPLICABLE DOCUMENTS

- ANSI/ISA-12.12.03-2011 Standard for Portable Electronic Products Suitable for Use in Class I and II, Division 2, Class I Zone 2 and Class III, Division 1 and 2 Hazardous (Classified) Locations
- IEEE Paper PCIC-4 “*Cellular Phones in Class I, Division 2/Zone 2 Hazardous Locations*”, Bozek, A., Martin K., and Cole, M.

### 4.0 RESPONSIBILITIES

Responsibilities are as follows:

- a. The SSC Safety and Mission Assurance Directorate (SMA), Center Operations Directorate (COD) and the Engineering & Test Directorate (ETD) shall:
  - Evaluate Portable Electronic Products (PEP) in accordance with the principles and guidance of ANSI/ISA-12.12.03-2011 to determine their suitability for use in Class I and II, Division 2 hazardous classification areas. Standard manufacturer, make, and model PEPs (i.e. Apple I-Phone 8, Apple I-Phone 8 Plus, Samsung Galaxy S10, etc. cell phones or the Surface Pro 6, Apple iPad, Samsung Tab S6, Dell Latitude 7200, Dell Latitude 5285, etc) shall be evaluated for use.
  - Evaluate any limitations and/or controls necessary for the approved use of the PEP in a hazardous classification area. This is commensurate with “Safe” or “Controlled Work” in accordance with SCWI-8715-0012.
  - Use the on line PEP Evaluation Request.
  - Maintained PEP evaluations for the life of the use of those PEP products. This documentation should include information for the product such as reference number or code, product manufacturer and model, owner name, approver name, and date approved or equivalent information.

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b. The SSC COD Office Of The Chief Information Officer (RA40) shall provide a system to track PEP products approved for use in Class I and II, Division 2 hazardous classification areas. The database will list approved (and disapproved) PEPs by manufacturer, make and model as well as any controls and/or limitations with their approved use.

c. All NASA SSC civil service employees and NASA SSC Direct Contractors shall abide by the requirements within this work instruction appendix.

## 5.0 PROCEDURES

1. Perform an assessment of a specific PEP by manufacturer, make and model. PEPs shall be assessed in the standard configuration planned for use in the field and hazardous classification area. For example, if the PEP will be used with a standard carrying case or protective case, it will need to be evaluated with the protective case. Acceptable PEP for Class 1, Division II hazardous classification areas must pass the following criteria:

- a. Assess or perform a drop test on the PEP.
  - The PEP shall be dropped from a distance two (2) meters (6 feet 6 inches) onto a concrete surface six (6) times in different orientations
  - To pass,
    - the integrity of the PEP enclosure shall not be compromised
    - the cell or battery shall not have fallen out or become disconnected
    - the PEP shall operate as intended
  - In lieu of a drop test per ANSI/ISA-12.12.03-2011, vendor data on the PEP and/or vendor data on the carrying/protective case for the PEP (i.e. cell phone or tablet protective cases) must indicated the protective case protects the PEP device from physical and functional damage for drops greater than 6 feet, 6 inches (2 meters)

**NOTE:** Many cell phones and tablets can be outfitted with protective covers.

**CAUTION:** Metallic protective cases are prohibited unless they are specifically design/rated for hazardous classification area OR are specifically designed to not produce a spark if dropped onto a metal or concrete structure surface.

- b. Assess the Radio Frequency transmission energy. The radiated radio frequency (9 kHz to 60 GHz) energy from a PEP, such as a radio, cell phone or tablet, is not considered an ignition source if the power is equal to or below the following limits.
  - 2 W maximum output averaged over 20 microseconds for Groups A and B and Group IIC (NOTE: Typical cell phones radiate under 2 W so their level of radio frequency radiation is acceptable for PEP 2)
  - 3.5 W maximum output averaged over 80 microseconds for Group C and Group IIB
  - 6 W maximum output averaged over 100 microseconds for Group D and Group IIA

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- 6 W maximum output averaged over 200 microseconds for Class II, Class III, or Zone 22 hazardous (classified) locations.

**NOTE:** If the power is above these limits, The operations with the PEP shall follow “Controlled Work” per SCWI-8715-0012.

- c. No provisions for forced ventilation into the PEP.
- d. No sparks visible/possible during in normal operation.
- e. No excessive temperatures in normal operation. PEP shall not produce surface temperature that are uncomfortable to the human touch
- f. No camera flashes.

**NOTE:** As a condition (control or limitation) for acceptance, a PEP may be accepted for use in a hazardous classification area, if the camera flash can be disabled. This may require training and awareness and/or signage at the entrance to the hazardous classification area, or adherence to the “Controlled Work” provisions of SCWI-8715-0012.

**NOTE:** PEP and other camera devices may be permitted in hazardous classification areas with prior approval of the area manager as long as the provisions of SCWI-8715-0012 are adhered to.

- g. No motors unless it can be demonstrated the motor incorporates non-arcing technology.

**NOTE:** Many cell phones incorporate a vibrate ring mechanism (either while in silent mode or not). The vibrator mechanism typically consists of a DC micro-motor turning a counterweight which provides the vibration effect. This vibrator mechanism incorporates a coreless motor design. Typical vibrator micro-motors have a voltage input of 1.25 V and running current of 120 mA. Typical cell phones incorporate a controller chip to stabilize DC output and limit both the temperature and current to the micro-motor. Test of these micro-motors in a Class IIC stoichiometric hydrogen mixture did not yield and ignition events for the micro-motors tested (see IEEE Study PCIC-4).

- h. The PEP cell or battery must be secured so it will not fall out during operation or in a drop test.
- i. The PEP shall be operated with no external electrical connections or wired accessories in the hazardous (classified) location. For example, wired headsets/ear plugs/phones, wired card readers, etc.
- j. The PEP exposed terminals (for example battery charging terminals) are either recessed or diode protected to prevent a discharge caused by an accidental shorting of these terminals.

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- k. The PEP power switch shall be in accordance with the following. Any product with a power on-off switch with contacts that directly interrupt battery current is not acceptable because the switch may cause an ignition-capable arc.

**NOTE** If the switch operator is not a maintained position device and requires the same action for on and off, then it is likely to be an electronic switch. Generally electronic products use the electronic circuit type of switch.

2. PEP devices approved for use in hazardous classification areas shall be inspected prior to use to look for any visible damage. **If there is any visible damage, the PEP device will not be used.**
3. Some acceptable controls and/or limitations that may be assigned to the approved use of a PEP include the following:
  - Drop resistant cases for cell phones (such as Otterbox, Speck, Pelican, etc) which are tested and rated for drops greater than 2 meters (6 feet, 6 inches).
  - Non-metallic cases for PEP.
  - Tethered PEP to preclude drops to lower levels or surfaces which may induce a spark
  - Taped/sealed battery compartment on portable electronic tools/equipment to prevent the batteries from dislodging during use.
  - Disabling flashes on internal cameras on cell phones, tablets etc.
  - Prohibiting wired accessories on PEPs (ear phones, head sets, card readers, etc)



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**ANSI/ISA 12.12.03-2011 Examples Of Potentially Suitable PEPS For Use In Hazardous**  
**(Classified) Locations**

<b>Product type</b>	<b>Potential Suitability</b>
Analytical Test Equipment <ul style="list-style-type: none"> <li>– Analog electrical multi-meter</li> <li>– Resistance tester</li> <li>– Digital multi-meter</li> <li>– pH/ORP meter</li> <li>– Ultrasonic gauges</li> <li>– Vibration monitors</li> </ul>	Controlled Work required Controlled Work required Available listed Available listed Available listed Available listed
Barcode Scanner	Available listed
Calculator	Available listed
Camera <ul style="list-style-type: none"> <li>– Lanyard secured</li> <li>– Battery powered</li> <li>– Flash</li> <li>– Digital; no zoom, no floppy drive</li> <li>– Digital; with zoom, or floppy drive</li> <li>– Video hand-held type</li> </ul>	PEP 2 possible PEP 2 possible PEP 2 possible; Flash must be turned off PEP 2 possible Controlled Work required Controlled Work required
Cell phone	PEP 2 possible
Flashlight	Available listed
Global Positioning Satellite Receivers - GPS hand-held	PEP 2 possible
Transponder	Acceptable because no power source
Gas detector	Available listed
Personal monitor device	PEP 2 possible
Hearing aid <ul style="list-style-type: none"> <li>– In ear or over ear</li> <li>– Some parts not in contact with skin.</li> </ul>	PEP 1 PEP 2 possible

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**(Classified) Locations (continued)**

Secure ID card	Available listed
Smart Card	Acceptable because no power source
Smart Key	Acceptable because no power source
Key fobs (Remote control) <ul style="list-style-type: none"> <li>– IR type</li> <li>– Radio types</li> </ul>	PEP 2 possible PEP 2 possible
Laptops <ul style="list-style-type: none"> <li>– Standard</li> <li>– Pressurized</li> </ul>	Controlled Work required due to suspect motors, suspect high temperatures, openings for ventilation and connections, and possible external connections. Must be evaluated.  Available in Europe
Implanted medical devices <ul style="list-style-type: none"> <li>– Pace maker</li> <li>– Defibrillator</li> </ul>	Acceptable because not exposed to atmosphere Acceptable because not exposed to atmosphere
External Medical Devices <ul style="list-style-type: none"> <li>– Insulin pump</li> </ul>	PEP 2 possible
Pagers <ul style="list-style-type: none"> <li>– Standard</li> <li>– Smart type, 2 way</li> </ul>	Available listed PEP 2 possible
Portable operator interfaces <ul style="list-style-type: none"> <li>Hand-helds</li> </ul>	PEP 2 possible (between laptop & palm, CE class) Controlled Work Required due to suspect motors, suspect high temperatures, openings for ventilation and connections, and possible external connections. Must be evaluated.

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**(Classified) Locations (continued)**

Personal Digital Assistant – PDAs with auxiliary connections – PDAs with no auxiliary connections	Available listed Available listed
Power Tools – Battery powered  – Line powered	Controlled Work required due to known ignition sources – motor brushes and switches Controlled Work required due to known ignition sources – motor brushes and switches
Two-way radios	Available listed
Respirator	Available listed
Satellite phone	Controlled Work required due to suspect output power level. Must be evaluated.
Wristwatch – Standard – With built-in pager, calculator, cell phone, etc	PEP 1 PEP 2 possible PEP 2 possible
Walkman® type devices	Controlled Work required due to suspect switches, motors, external connections etc. Must be evaluated.
MP3 type device	Controlled Work required due to suspect switches, motors, external connections etc. Must be evaluated.
Digital Recorder	PEP 2 possible