



EMERGENCY RESPONSE/SAFETY PLAN

Prepared for:

SOFC SS-250 Fuel Cell Project

Located at:

159 Allen Place

Hartford, CT 06106

Owned by:

Allen Place Fuel Cell, LLC

c/o: FuelCell Energy, Inc.

3 Great Pasture Road

Danbury, CT 06810

Prepared by:

Fuel Cell Energy, Inc.

3 Great Pasture Road

Danbury, CT 06810

Prepared: 02 December 2022

A current copy of this Plan is to remain in an accessible location on-site at all times



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Appendix A: Plant Layout with Exit Pathways / Assembly Area and Utility Shutoffs – Plan view drawings attached identify that there is no exit pathways on the plant itself since it is an unmanned and a remote operating facility



1 INTRODUCTION

The SS-250 Solid Oxide Fuel Cell (SOFC) Trinity College Fuel Cell Project is a fuel cell power plant whose equipment is owned by Allen Place Fuel Cell, LLC, a wholly owned subsidiary of FuelCell Energy, Inc. ("FCE"). The plant is situated on 159 Allen Place Hartford, Connecticut. One SS-250 fuel cell plant and appurtenant equipment will be constructed on concrete slab pad(s), at an elevation of the site (59 ft. ASL). The power generated from the fuel cell plant will be stepped up and fed to Trinity College Switch gear at 4KV. The net generating capacity of the single fuel cell power plant is 250 KW, nominal. This Emergency Response / Safety Plan has been prepared as required by the Occupational Safety and Health Administration (OSHA) general industry standard at 29 CFR 1910.38. The Fire Prevention & Emergency Plan has been prepared in accordance with the requirements of the National Fire Protection Agency Standard 853.

General

FCE SureSource 250 fuel cell plant is designed and operated as an unmanned power generation facility. The control system for the plant is designed for the system to be "fail safe" in the event of an emergency or unsafe operating condition(s). For any emergency event or unsafe operating condition that has a potential safety consequence, the plant control system initiates an emergency shutdown ("ESD") sequence that isolates the external fuel source from the plant and trips the fuel cell generators.

A SureSource 250 Plant Emergency Shut Down event isolates the natural gas fuel supply from the plant through the use of dual, fast-acting, spring-loaded block valves located at the plant fuel gas supply connection. An ESD event also triggers automatic isolation of the fuel desulfurizer vessels and initiates the purging of the downstream fuel train components through the module using the onsite supply of inert nitrogen gas. Purging the residual fuel train contents out through the module results in the fuel being oxidized to innocuous end products. An ESD event also results in the fuel cell module(s) and inverter(s) being disconnected from the electric substation. Unexpected process deviations or equipment operation malfunctions that can only cause equipment damage, but no possible safety consequences can result in the fuel cell plant shutting down and switching off the electric point of interconnect. During any of these types of events, operators at FCE's 24/7/365 manned Global Monitoring and Control Center ("GMCC"), will immediately assess the operational condition of the plant and take appropriate actions to stabilize or recover the plant to operational status, whichever is appropriate for the situation. If any on-site response is appropriate for the situation, the GMCC operator will contact appropriate personnel, be they an FCE field service technician, or in the very unlikely event of a developing emergency response situation, local emergency response personnel.

Following, in Table 1, is an outline description of the fuel cell plant and other site equipment included in this project.



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Table 1: Plant Descriptions

Plant Model: SureSource 250

SureSource 250 skid consists of a Solid Oxide fuel cell module, a Mechanical Balance of Plant, and an Electrical Balance of Plant. The skid will also store fuel gas treatment and nitrogen supply equipment. The project site will include electric utility interconnection switchgear and instrumentation.

Number of Fuel Cell Plants:	1 X SS-250
Fuel Cell Power Output:	250 KW nominal
Installation Location:	Outdoors
Fuel type:	Pipeline Natural Gas Utility supply pressure: 20-25 psig to site desulfurizers Fuel cell plant reduced operating pressure: <15psig
Plant Output Voltage:	480 V / 3 Phase / 60 Hz
EBOP/ Invertor Manufacturer:	Dynapower (with in the Skid)
EBOP Transformer Type / Dielectric Fluid:	Air-Cooled / none (Dry Type)
MBOP Transformer Type / Dielectric Fluid:	Air-Cooled / none (Dry Type)

Additional Appurtenant Equipment

Water Treatment System:	Continuously recirculating carbon filter and dual-ion exchange resin bend. All installed in its own enclosure inside SOFC skid enclosure.
Nitrogen Supply:	Nitrogen tank will be part of the SOFC skid
Ancillary Heat Recovery Equipment:	HRU with piping and Flanges to Boiler Room
Project Equipment not in FCE scope:	Connections beyond Flanges in Boiler Room
SITE COORDINATES:	Latitude: 41.751711° North Longitude: 72.690391° West

Equipment not described above is not covered by this plan.

EMERGENCY RESPONSE / SAFETY PLANS

Employers are required by the Occupational Safety and Health Administration (“OSHA”) Standard at 29 CFR 1910.38 to have a written Emergency Action Plan (“EAP”) for workplaces.



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The EAP can serve to fulfill the requirements of an Emergency Response Plan when the plan for emergency response activities is to evacuate the premises and to allow professional emergency responders to perform the required emergency response activities. Due to the nature of FCE SureSource fuel cell power plants being unmanned, remotely operated, and fail-safe in operational philosophy and control, it is the practice and policy of FCE to instruct workers & owners, through a workplace EAP, to evacuate the premises in emergency situations and to summon professional emergency responders to perform required emergency response activities.

NFPA 853 is the national standard for the installation of Stationary Fuel Cell Power Systems and requires the preparation of a written Fire Prevention and Emergency Plan for fuel cell installations. The Fire Prevention and Emergency Plan is to be prepared in accordance with the requirements of Section 8.2 of NFPA 853 and is to include descriptions of fire prevention procedures, inspections, housekeeping practices, flammable material storage, control of ignition sources, procedures for fire protection equipment impairment, fire emergency plans and other information.

The OSHA standards for General Industry (Part 1910) and Construction (Part 1926) at Title 29 of the Code of Federal Regulations require that employers comply with a host of health and safety standards. Such requirements are outlined in employer safety programs and policies. Summary statements of corporate health and safety policies are often prepared for employee quick reference on an individual plant or project-specific basis.

Copies of the Emergency Action Plan, Fire Prevention & Emergency Plan and Plant/Project Safety Plan for the Trinity College Solid Oxide Fuel Cell (SOFC) Project follows:

2.1 *Emergency Action Plan*

The following is the Emergency Action Plan (EAP) for the subject plant. As the plant is at the start of construction, this EAP will serve as both a construction phase and an operation phase document. If required, it will be updated again as necessary to appropriately reflect specific site conditions and limitations at final project completion.

Site Name: **Trinity College Solid Oxide Fuel Cell Project**

Site Address: **159 Allen Place
Hartford, CT 06106**

Plant Operator: FuelCell Energy, Inc.
3 Great Pasture Road
Danbury, CT 06810

Plant Owner: Allen Place Fuel Cell, LLC
3 Great Pasture Road
Danbury, CT 06810

A. Emergency Plan Coordinator & Other Contacts



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Emergency Plan Coordinator –

Name: **Global Monitoring and Control Center (GMCC)**
 Company: FuelCell Energy, Inc.
 Description: 24 hours / 365-day Plant Monitoring
 Telephone No: **(800) 326-3052**

Additional Contact information –

Site Operator Contacts: (*NOTE: private telephone numbers have been redacted from public report to protect privacy*)

Name: Valerie Hoffman
 Co./Dept./Title: FCE / Field Service / Field Service Manager
 Telephone No: (203) 917 1178 (FCE)

Name: Saffi Gilani
 Co./Dept./Title: Project Manager
 Telephone No: (860) 496-2260

Name: Leah Burns
 Co./Dept./Title: FCE / Senior EH&S Field Services Coordinator
 Telephone No: 475-296-4544 (FCE)

Name: Daniel Preli
 Co./Dept. /Title: FCE / Director, Environmental, Health and Safety
 Telephone No: (860) 496-2279 (FCE)

Name: Michael (Mike) Gibbons
 Co./Dept. /Title: Facility Project Manager
 Trinity College
 Telephone No: (860) 303-4734

Additional Owner Contact:

Name: RESERVED
 Co. /Dept: RESERVED
 Telephone No: (XXX) XXX-XXXX (Office); (XXX) XXX-XXXX (Cell)

Additional Site Contacts:

Name:	RESERVED	RESERVED
Co. /Dept:	RESERVED	RESERVED
Telephone No:	(XXX) XXX-XXXX	(XXX) XXX-XXXX

Site Utility Contacts:

Company: **Connecticut Natural Gas – Avangrid**
 Name/Dept./Title: Gas Leak/ Emergency Line
 Telephone No: (860) 246-5325 (or 9-1-1)



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Company: **Electric Power – Eversource**
Name/Dept./Title: Emergency Number
Telephone No: (800) 722-5584 (or 9-1-1)

Company: **Water Service – MDC - The Metropolitan District**
Name/Dept./Title: Water Emergency Number
Telephone No: (860) 278-7850 Ext 1

Company: **Sewer Service – MDC - The Metropolitan District**
Name/Dept./Title: MDC Emergency Number
Telephone No: (860) 278-7850 Ext 1

Company: **Nitrogen Gas Air Products**
Name/Dept./Title: Air Products Emergency response
Telephone No: (800) 523-9374

Government Official Contacts:

(Note: Government officials are only to be contacted by designated FCE personnel, per established FCE policy/procedure, described later in this Plan)

City of Hartford

Mayor – Luke Aaron Bronin; (860) 757-9500
Fire, Police, Ambulance Dispatch ([local] Emergency dispatch) – 9-1-1
Police, non-emergency – (860) 757-4000
Fire Dept., non-emergency – (860) 757-4500

State Legislators – Hartford, CT

State Representative – Julio Concepcion; 860-240-8585
State Senator – John Fonfara (District S01); (800) 842-1420;
US Congressman – John B. Larson (1st District); (202) 225-2265;

Private Residences/Establishments requesting notification of emergency response incidents (per formal request):

Neighboring Resident or Establishment Name	Neighbor Street Address	Contact Information – Phone and/or email
<i>none</i>		

B. Preferred Means of Reporting Emergencies



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GMCC is to contact local Emergency Responders in accordance with this Plan, if required, or when requested to do so by on-site personnel.

Emergency	Make Initial Notification to:
Fire / Explosion	<p data-bbox="857 449 1419 499">9-1-1 (for calls originating on-site only)</p> <p data-bbox="912 537 1364 588">860-278-7850 (MDC)</p> <p data-bbox="857 625 1419 655">(For calls originating from other than on-site)</p>
Flammable/ Hazardous Material Release	
Medical Emergency	
Threat / Violence	
Severe Weather	Coordinate with FuelCell Energy GMCC (800) 326-3052

GMCC is to then contact a FCE Field Service Management representative and then make any additional utility / owner / community resident contacts as directed to by FCE F.S. Management representative.

C. Emergency Action Plan Elements

- **Emergency Escape Procedures and Routes**

Emergency escape routes and assembly areas are depicted in the drawing provided in Appendix A.

Upon discovery of the need for an evacuation (either self-initiated or in response to an evacuation call), all personnel shall immediately proceed to the nearest safe exit and then immediately proceed to the designated assembly area. Non-FCE contractors and guests shall be escorted by their host FCE employee to the nearest safe exit.

In the course of an evacuation, ***a call shall immediately be placed to GMCC with a request/instruction for the second GMCC operator to immediately call local Emergency Responders*** (See *Emergency Action Plan, Section B*) to initiate action by the local emergency response organization(s). The caller is to stay on the line and provide all information requested, including name, location, nature of emergency and additional contact information, as may be requested.

With the exception of a small 'incidental' spills (as defined by OSHA and per FCE employee training), FCE employees shall not perform chemical spill response activities. Emergency or private spill response contractors are to be retained for the cleanup of non-incidental spills.



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All releases of ANY material are to be reported to the FCE EHS department as soon as practical.

- **Procedures for Employees who Remain to Operate Critical Operations Before Escape**

All employees are expected to immediately proceed to the designated assembly area during any call for site evacuation as referenced in Appendix A.

- **Employee Accountability Procedures after Evacuation**

The Trinity College Solid Oxide Fuel Cell (SOFC) Project is a normally unmanned site; however, one or more FCE, owner or visiting personnel may be present on site to perform operating, maintenance or other tasks. Per established site work/visitation procedure, all FCE and other personnel present on-site will be known by both the senior FCE Field Service employee present at the site and the off-site GMCC operator. Upon the implementation of an evacuation, cell phone contact is to be immediately established with GMCC to update or confirm the list of on-site personnel. Accounting of all on-site personnel shall be made at the assembly area.

- **Rescue and Medical Duties**

FCE employees are not routinely provided with rescue or in-depth medical training, and as such are not required or expected to perform rescue or medical duties. FCE employees are NOT to reenter the site following an evacuation prior to an 'all-clear' call being made from the professional first responder person in charge.

- **Alarm System**

FCE plants are normally unmanned sites, with only a small number of workers present on site at any given time. Typically, one, sometimes two, and on rare occasions more than two workers are present on site when work is being performed. When multiple workers are on site, they will typically be working together.

*The employee alarm system to be used at the Trinity College Solid Oxide Fuel Cell (SOFC) Project site is **direct voice communication**. The OSHA standard for employee alarm systems at 29 CFR 1910.165 allows the use of direct voice communication as an acceptable procedure for sounding an alarm system for workplaces of 10 or fewer employees, provided all employees can hear the alarm.*

Upon discovery of a situation requiring evacuation, the discovering employee shall directly communicate the evacuation requirement to his/her fellow employees. Any non-employee guests on-site will be escorted by their host employee to the nearest clear exit at that time. It is envisioned that all employees present on site at any time will be capable of hearing a call for evacuation under foreseeable circumstances.

- **Training**



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All employees and contractors working at, and visitors to, FCE fuel cell power plants are to be trained in the elements, policies, and procedures of this Emergency Action Plan prior to, or at the time of their first visit. All persons present at FCE plant sites are expected to comply with all elements of this plan in emergency situations.

D. Emergency ShutDown (ESD) Procedures

ESD Pushbutton located at the site can be used to shut down the operation of the equipment.

1. Site Electrical Disconnect pushbutton: The following ESD pushbutton will **both disconnect the fuel cell plant and open the plant utility electric Tiebreaker:**

- EBOP Tie Breaker Switchgear

Note that some Mechanical-Balance-of-Plant and Electrical-Balance-of-Plant devices are also UPS (uninterruptable power supply) powered, so some low voltage equipment may temporarily remain energized even after opening a Tiebreaker Disconnect or depressing an ESD pushbutton. **Note also that a hot fuel cell module may contain hazardous voltage, even when not operating.**

2. Fuel Cell ESD pushbutton: The following ESD pushbutton will stop the operation of the fuel cell plant equipment:

- A pushbutton on the control panel

NOTE: Some Mechanical-Balance-of-Plant equipment and Electrical-Balance-of-Plant switchgear, PCU and transformer equipment may remain energized even after depressing one of these ESD pushbuttons. Note also that a hot fuel cell module may contain hazardous voltage, even when not operating.

E. Special Training

FuelCell Energy personnel who work at fuel cell plants receive Hazard Communication training in the chemical hazards that are present on site. Operating personnel also receive training in other occupational safety and health (OSHA) standards, as appropriate for the tasks to which they are assigned.

F. Personnel Accounting Following Evacuation

In order, to be accounted for, all personnel present on site at the time of an evacuation are to proceed to the designated assembly area. Contact will be made with GMCC and the ranking supervisor on site will determine if all personnel are accounted for or if any personnel are missing. The results of the accounting determination will be reported to the professional first responder in charge of the emergency response.

G. Rescue and Medical Duties



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All rescue and medical duties required at any FCE fuel cell plant will be performed by professional emergency response personnel.

2.2 *Fire Emergency and Prevention Plan*

The following is the Fire Emergency and Prevention Plan for the subject plant. As the plant has not been constructed to date, this Fire Emergency and Prevention Plan will be updated as necessary to appropriately reflect specific site conditions and limitations, as FCE becomes aware, and construction is completed.

Fire Emergency Plan

Purpose:

This document provides information specific to FCE's SureSource 250 fuel cell power plant, as described in the Plant Description section earlier in this Plan (Table 1). The document has been prepared in accordance with the requirements of Section 8.2 of NFPA 853-2015.

A. Response to Fire or Other Emergency Condition

- **Overview of fire hazards present**

The gas meter that supplies natural gas to the fuel cell site is complete with manual emergency shutoff valves and is located on the fuel gas utility supply fuel train. Natural gas (odorized) is supplied to the fuel cell desulfurizers via pipe at a nominal pressure of 20 psig. After the desulfurizers, the fuel cell plants then reduce the fuel gas pressure to less than 15 psig and direct the gas flow into the fuel cells.

Natural gas is de-odorized by flowing through the two desulfurizer vessels serving the entire site. The desulfurizer vessels are each equipped with a pressure safety relief valve (PSV), sized for both a failed upstream pressure reducing valve and a fire exposure condition. The PSVs discharge to a vent termination and any flow through a PSV is immediately detected by an in-line flow sensor, which in turn immediately initiates a plant ESD. De-odorized fuel flows through the fuel cell power plant equipment, including the fuel humidifiers and the preconverters, before entering into the fuel cell modules. The air heaters also operate on an intermittent basis on de-odorized fuel. All fuel gas is confined within code-complying process piping and vessels. All fuel sample valve taps are small bore and "double blocked" by virtue of tethered caps.

The fuel cell power plant operates at high internal temperatures. Temperatures inside the insulated fuel cell module are approximately 1500°F and the fuel fired air heater also operates at temperatures of up to 1500°F. The fuel humidifier and connecting pipes also operate at high temperature. Insulation or guards are provided to maintain equipment external surfaces at touch-safe temperatures.



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Ancillary pieces of electrical equipment are provided with or are appurtenant to the fuel cell power plant. Some electrical equipment may operate at high current and/or medium voltage (>500V) and therefore generate appreciable heat. All electrical equipment is designed to applicable codes, including provisions for adequate heat dissipation.

- **Notifications and coordination**

Upon discovery of a fire or other emergency condition, or acknowledgement of a fire alarm associated with the fuel cell power plant, the discovering or acknowledging person shall make notifications to the appropriate persons as outlined in the Site Emergency Action Plan.

An on-site discovering person who is trained in the operation and maintenance of the fuel cell power plant and who has evacuated the site for an emergency situation shall remain stationed in proximity to the site and accessible to emergency responders throughout the emergency response time frame in order to assist and support responders with technical expertise as they may request or require.

An on-site discovering person who is a representative of the plant/facility owner shall remain on-site throughout the emergency response time frame to assist and support responders with plant/facility owner information and resources, including access to required resources and traffic control as emergency responders may request or require.

- **Evacuation and restriction of non-response personnel**

Upon discovery of a fire or other emergency condition associated with the fuel cell power plant, the plant area shall be immediately evacuated of all non-response personnel to a minimum distance of 100 feet. Plant host facility representatives and qualified plant operating personnel shall identify themselves to Emergency Response personnel and remain nearby and available to assist in response activity support, as necessary. Notifications of nearby residents as required by the Emergency Response Person in Charge, shall be undertaken as directed, per the EAP.

- **Operator activities**

On-site personnel:

- Upon discovery of a fire or other plant emergency condition with the plant still running, while immediately evacuating the area of self and others, depress any Emergency ShutDown (ESD) pushbutton, if it is safe to do so. ESD buttons are situated at several locations around the plant and as can be identified by their red mushroom caps and labeling.
- Upon discovery of a fire or other emergency condition with a plant that has experienced an Emergency ShutDown (ESD), immediately evacuate others and self.



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- Contact GMCC and instruct GMCC to in turn contact local Emergency Responders. As an emergency situation, advise GMCC to make other required notifications to management personnel, owner, and others, per Emergency Action Plan.
- Remain on-site at a safe distance to assist and support responding personnel, including providing plant access, restricting access of non-responding personnel, or controlling traffic.

Remote GMCC (Global Monitoring and Control Center) operators:

- Upon advisement or acknowledgement of a *fire-related* Emergency Shutdown or knowledge of other emergency condition, make Emergency Responder and all other required notifications as described in Emergency Action Plan.
- If not already present, dispatch field service personnel to the site to assist and support response personnel with fuel cell technical expertise.

B. Fire Extinguishment / Emergency Plant Shutdown

- **Fire water application concerns**

FIRE WATER SHALL NOT BE APPLIED TO COMPONENTS OF THE FUEL CELL POWER PLANT AT ANY TIME. Certain fuel cell components may remain electrically energized with either alternating current or direct current voltage even after a system shutdown via one of the Emergency ShutDown (ESD) pushbutton switches.

- **Appropriate extinguishing media**

Only fire extinguishing medias appropriate for live electrical equipment shall be applied to fuel cell power plant components. Only listed fire extinguishers for Class A: B: C type fires are provided inside the plant enclosed area.

Upon Emergency ShutDown (ESD) of the fuel cell power plant, all fuel supplies to the plant are automatically shut off via two in-line fast-acting spring-loaded isolation valves.

Following an ESD, **ELECTRICAL ISOLATION IS NOT ASSURED.** Substantial AC and/or DC voltages may remain for a significant time following an Emergency ShutDown event.

FOLLOWING AN ESD SOME NATURAL GAS WILL REMAIN ISOLATED WITHIN THE FUEL DESULFURIZER VESSELS; however, these vessels are protected from over pressurization by pressure safety valves sized for fire exposure conditions. Following an ESD, cover gas (4% H₂ balance N₂) supplied from an on-site source will flow through the fuel cell plant equipment. As with the desulfurizers, the nitrogen source



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supply is protected against over pressurization by a safety relief valve provided by the gas supplier.

- **Other Emergencies**

Hazardous material spills – Hazardous materials that may be temporarily present on-site other than natural gas are typically desulfurizing media solids, and usually only in small quantities. Trained hazardous material operations and response personnel are on-site for any operations or maintenance activities that involve the handling of bulk or containerized hazardous materials. Small quantities of water treatment chemicals are contained in the water treatment enclosures.

Transformer dielectric oil – The project site uses dry type EBOP MBOP transformers that do not contain dielectric oil.

Personnel injuries – For injuries requiring medical attention, the injured party or his/her companion shall seek appropriate medical attention for the injured. For serious injuries, call GMCC to summon local Emergency Responders per the Emergency Action Plan. For less serious injuries that require medical attention the injured shall obtain medical treatment at the nearest emergency medical care facility. All incidents shall be reported to FCE EHS.

C. Plan Validation

The executable elements of this Fire Emergency Plan consist of the manual activation of an Emergency Shut Down upon discovery, evacuation of the power plant area and notifications.

ESD buttons are all hard-wired in a fail-safe circuit. All fuel cell operating personnel are trained and regularly re-trained in a complete suite of safety programs.

Fire Prevention Plan

A. Egress

A Plant Layout drawing is provided in Appendix A. The plant emergency egress paths are depicted on the drawing.

B. Emergency alarms and ShutDowns

The fuel cell power plant is provided with Emergency ShutDown (ESD) pushbuttons. ESD pushbuttons have red mushroom caps. Depressing an ESD pushbutton will immediately shut down fuel flow to the power plant as well as shut down all of the mechanical balance of plant equipment. **HOWEVER, THE ESD DOES NOT OPEN THE ELECTRICAL TIE BREAKER, SO ELECTRICAL BALANCE OF PLANT COMPONENTS WILL REMAIN ENERGIZED. ADDITIONALLY, UNINTERRUPTABLE POWER SUPPLIES (UPS) WILL PROVIDE POWER TO A NUMBER OF MECHANICAL BALANCE OF PLANT COMPONENTS AND THE FUEL CELL**



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MODULE WILL RETAIN SIGNIFICANT DC VOLTAGE POTENTIAL ENERGY IF OPERATING OR HOT PRIOR TO THE ESD. (Exception – the SITE switchgear ESD button does open the electric tiebreaker; however, hazardous voltage may still remain).

The following types of automatic acting emergency sensors are provided with the fuel cell power plant:

- Combustible gas detectors
- UV/IR Flame detectors
- Smoke detectors

In addition, process flows, temperatures, pressures and voltages are continuously monitored for deviations from expected values. Process sensors are used to verify proper operation of the process and will quickly sense and shutdown the process upon severe deviations, such as would occur in the case of excessive seismic activity. Emergency sensors have either supervisory signals or are wired to alarm on sensor failure such that the plant will ESD on the loss of these devices. Emergency sensors are calibrated in accordance with an established schedule as described in the maintenance manual.

Sensor detection of flame, MBOP smoke, or presence of excessive combustible gas concentration (45% of Lower Explosive Limit [LEL]) will result in an Emergency ShutDown (ESD) of the fuel cell plant. In the case of combustible gases, detection of a concentration of approximately 25% LEL will result in a high LEL warning alarm. EBOP smoke detectors provide an alarm function only as other performance shutdowns protect the equipment in case of actual fire.

Fuel cell plant operating personnel are provided with portable gas detectors for use in operating and maintenance tasks including surveillance for gas leaks should such precautionary efforts be necessary.

C. Fire prevention

The fire prevention strategy for the fuel cell power plant consists of the following Plan elements:

- **Housekeeping**

The area around the fuel cell power plant shall be kept orderly and free of combustible and flammable materials, including combustible and flammable liquids, flammable gases and combustible and flammable solid materials. Trash shall not be allowed to accumulate. The water treatment system container shall not be used for general material storage.



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- **Storage and Handling of flammables/combustibles**

STORAGE OF FLAMMABLE AND COMBUSTIBLE MATERIALS IS PROHIBITED WITHIN THE PLANT ENCLOSURE WITHOUT PRIOR WRITTEN PERMISSION FROM THE LOCAL AUTHORITY HAVING JURISDICTION. Transient flammables and combustibles may include gases, small containers of flammable liquids such as solvents, trash and virgin and spent consumables used in the fuel cell process. These materials are to always be stored in packaging appropriate for their material properties and retained on site for as short of a duration as feasible. Flammable and combustible materials are to be kept separated from sources of ignition, fuel piping and processing equipment and electrical equipment and shall be protected from weather. Appropriate packaging materials for consumable materials are as follows:

- Catalysts, virgin or spent – closed/sealed steel drums
- Desulfurizer media, virgin – manufacturer's original packaging
- Desulfurizer media, spent – closed/sealed steel drums

Flammable/combustible materials and potential ignition sources

The following are flammable/combustible materials *potentially* present at the fuel cell power plant:

- Natural gas (present in piping and desulfurizer vessels only - no on-site storage)
- Electrical equipment
- Plastics
- Insulation jacketing
- Desulfurizer media (including forms of activated carbon and other, mainly non-flammable formulations)
- 50% aqueous solution Propylene Glycol EBOP chiller coolant and heat transfer medium
- Misc. new and used filter elements, PPE, packaging, etc.
- Granular nickel-based catalyst (DOT Div. 4.2, PG II/III; transient storage only, never long-term)

Natural gas piping within the plant security fencing is identified with yellow "Natural Gas" pipe markers, complying with ANSI A13.1 requirements.

The following are potential ignition sources present at the fuel cell power plant:



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- Heat from process
- Electrical equipment
- Catalysts
- Hot work
- Unauthorized Smoking or open flame
- Internal combustion equipment/vehicles

The fuel cell power plant design and procedures established to operate and maintain the plant have been formalized to minimize any potential for fire.

- The entire plant has been designed to and complies with the provisions of the ANSI/CSA safety code FC-1 (2004).
- The plant is equipped with automatic safety sensors to safely shut down the process in cases of leaking fuel or fire (Section B.)
- All fuel is pipeline supplied with minimal fuel holdup within the process.
- Desulfurizer vessels have been provided with pressure safety relief valves sized for fire emergencies.
- All of the plant piping has been designed in accordance with ASME B31.3 standard for process piping code. Piping is marked in accordance with ANSI A13.1.
- Areas of potential hazardous (classified) atmospheres have been identified and sources of potential ignition have been removed and any electrical equipment within complies with the area classification designation.
- Electrical equipment is designed to and complies with the provisions of UL1741.
- Smoking is NOT allowed within the fuel cell plant area.
- Hot Work within the fuel cell plant area is by Permit only, with potential sources of flammable materials removed from the area of potential ignition when hot work is conducted. Hot Work Permits are to be issued by the plant owner/operator. Additionally, any hot work conducted under the supervision of FuelCell Energy will also be permitted under the FCE Hot Work Permit program.

- **Portable Fire Extinguisher**

Sufficient type A: B: C portable fire extinguishers (20 lb. minimum), are installed at the plant such that the travel distance to nearest extinguisher does not exceed 50



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feet. Portable fire extinguishers required for specific maintenance procedures are brought to site by service personnel as special equipment for that procedure.

- **Inspections of plant area and fire prevention equipment**

All inspections and maintenance of fuel cell components and systems are to be performed in accordance with the latest revision of the plant maintenance manual. Operating personnel also conduct an informal “walk around” inspection every time they visit the plant site. As the plant operates remotely without the presence of operators, the walk around inspection is simply to check for any out of the ordinary situations or accumulated materials. FuelCell Energy operators log any negative findings into a Computerized Maintenance Management System (CMMS) database. Sensors are calibrated or replaced in accordance with an established maintenance schedule based on equipment manufacturer’s instructions; with work orders scheduled and records maintained by the database.

If, during an operator site visit or walkaround inspection a fuel leak is discovered, an immediate evaluation and disposition shall be undertaken. For sizeable leaks, an immediate plant shutdown may be necessary, while leaks of a very minor nature may be able to be addressed by such remedies as flange bolt retorquing or other measures. FCE operators are equipped with portable fuel gas (LEL) meters to assist in the evaluation of leak severity. Any discovered leak and its corrective measures shall be recorded in the CMMS database.

UV/IR flame detectors, combustible gas (LEL) sensors and smoke detector automatic sensors shall be tested, calibrated, maintained and/or replaced at the frequency provided in the SureSource plant maintenance manual. A summary of these requirements is provided below:

Automatic Sensor	Frequency	Maintenance Action
Skid 1 Smoke Detectors	18 mos.	Test & replace if required
EBOP Smoke Detectors	18 mos.	Test & replace if required
Combustible Gas Detectors	6 mos.	Clean, test & calibrate, if req'd.
UV/IR Flame Detector	18 mos.	Clean & Test

- **Fire protection system/equipment impairment**

Unintended impairment of any fire protection sensor system will automatically ESD the plant. Manual short-term sensor impairment for the purpose of on-site maintenance occurs only at times when maintenance personnel are on-site and vigilant for signs of fire or potential fire. As a policy, extended system impairment is



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not permitted with rare exceptions and only when alternative monitoring methods can be implemented by remote monitoring and for as short of a duration as possible.

- **Incident investigation and reporting**

Any fire-related incident shall be immediately reported to the Local Fire Department as “lead investigator.” Plant owner representatives as well as FCE-qualified personnel will be called upon to assist the Department in the site and technical aspects of the investigation. Such incidents will also be investigated by the fuel cell operator/manufacturer (FCE) as required by the manufacturer’s Certifying Agency. Results/conclusions of the investigation will be reported to the plant owner. External reporting to other agencies will be as directed by the responding Department commanders and as required by regulation, as established at the time of incident.

2.3 Plant/Project Safety Plan

The following is the Safety Plan for the subject plant. This Safety Plan will be updated as necessary to appropriately reflect specific site conditions and limitations, as FCE becomes aware and as construction progresses.

Safety Plan

FCE will address site security and personnel safety as the highest priority to ensure a safe and healthy work environment. Minimum safety requirements and policies have been identified and will be provided and enforced on all levels and for all organizations performing work at the facility during both the construction and operation phases of the project.

In addition, all contractors and subcontractors will be required to provide, adhere to, enforce, and report on their own safety policies and practices to FCE. Such policies, procedures and/or handbook will be provided to FCE prior to contract execution for FCE’s review and consideration.

Contractor pre-qualification and EH&S management is conducted using ISNetwork contractor information management system.

A. Site Supervision

FCE, or their prime construction subcontractor, will provide a construction/safety manager to be present while any work is being performed on site at any time. FCE Project Management representatives and EHS professionals will perform additional on-site review and inspections to further enforce all safety policies and practices.

Further, contractors and subcontractors will be required to have their own safety supervisor on site at all times when work is being performed. The safety supervisor is responsible for their personnel’s adherence to all required and prudent safety policies and practices. The supervisor is to be responsible for:



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- Enforcing safety policies and practices,
- Providing safety orientation for any new personnel onsite,
- Daily safety “toolbox” meetings covering daily activities and associated risks, by trade,
- Recording the daily safety meetings,
- Participating in contractor Job Safety Analysis,
- Weekly safety status meetings and discussion topics,
- Performing and reporting on weekly safety audits,
- Maintaining a daily personnel attendance log (for personnel accounting),
- Site walks with FCE’s safety and construction managers on request, and
- Monthly formal reports including labor hours worked, incidents (including near misses, recordable events, and reportable events) along with a detailed description of corrective actions, audit results, and a summary of any site walks that occurred during that period.

At any time, FCE or subcontractor’s safety or construction management personnel can enforce a stop work directive to correct any safety infractions.

B. FCE Safety Program Policies

Construction contractor and plant operator shall plan and conduct all work to safeguard persons and property from injury and will direct performance of work in compliance with reasonable safety and work practices and with applicable federal, state and local laws, rules, and regulations including but not limited to "Occupational Safety and Health Standards" promulgated by the U.S. Department of Labor. Work in areas adjacent to electrically energized equipment and/or operating natural gas equipment shall be performed in accordance with said practices, laws, rules, and regulations.

As part of FCE’s continuing efforts to provide a safe and healthy workplace, it is required that all work activities be performed in accordance with all applicable regulatory requirements. While impossible to foresee all potential circumstances, the below list of Environmental, Health and Safety requirements constitutes the minimum basic elements to be followed during both the construction and operation phases of the fuel cell power plant project.

- SIGN IN: All individuals must sign in/out at the office each day that they are on site.



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- **INCIDENTS:** All incidents occurring on the premises shall be reported immediately to the Construction Manager in charge of the work being performed, or during operation phase of plant, and to the FCE EHS department as soon as possible.
- **CHEMICAL RELEASE OR SPILL:** Any release of chemicals on site, regardless of volume, must be immediately reported to the Construction Manager, or during operation phase of plant, to the FCE EHS department as soon as possible.
- **COMPRESSED GAS MANAGEMENT:** The management and use of compressed gas is to be performed in accordance with OSHA standard 29 CFR 1910.101 “Compressed Gasses, General Requirements.”
- **CONFINED SPACES:** All work in “confined spaces” is to be managed in accordance with OSHA standard 29 CFR 1910.146.
- **CRANE HOIST & SLING SAFETY:** The operation of cranes and hoists is to be performed in accordance with OSHA standard 29 CFR 1910.179; and the use of slings is to be in accordance with OSHA standard 29 CFR 1910.184. Any crane picks must be pre-planned and pre-approved by FCE EHS prior to start.
- **ELECTRICAL SAFETY:** All work involving electricity is to be performed in accordance with OSHA standards 29 CFR 1910 Subpart S, “Electrical Safety”; 1910.269 “Electric Power Generation, Transmission & Distribution; and NFPA 70E-2004 “Electrical Safety in The Workplace” as applicable.
- **EYE PROTECTION:** During all times that ANY work is being performed anywhere on the facility, all personnel at the facility must be wearing eye protection.
- **FALL PROTECTION:** All work performed at heights of six feet or greater must be provided with at least one form of fall protection that will either prevent a fall from occurring, or properly arrest a person’s fall once the event has occurred. However, platforms, or other surfaces designed primarily for walking, shall be provided with an approved guardrail system when they are either; >4' above the adjacent floor or ground level, or above dangerous equipment (conveyor belts, chemical baths, exposed rebar, etc...) regardless of height. In all cases, work at height must be performed in accordance with OSHA standards 29 CFR 1910.23, 132, and 503.
- **HAND & PORTABLE POWER TOOL SAFETY:** Hand and portable power tools are to be used in accordance with OSHA standard 29 CFR 1910 Subpart P.
- **HAZARD COMMUNICATION; RIGHT to KNOW:** 29 CFR OSHA standard 29 CFR 1910.1200: Employees shall not be exposed to Hazardous Chemicals without first receiving training on the associated physical and health hazards and the measures needed to protect the employee from these hazards.
 - FCE utilizes green on white Target Organ Labels identifying the Name and the Physical & Health hazards of a material; these labels shall be



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used for all containers not otherwise adequately labeled by the manufacturer.

- Hazardous materials brought on site shall be labeled and a Safety Data Sheet (SDS) supplied to the Environmental Health and Safety (EHS) Department prior to working with the chemical.
- An MSDS station detailing all chemicals currently onsite is available for review.
- **HAZARDOUS MATERIALS:** FCE EHS is to be notified in advance of all hazardous materials to be brought on site. Storage, use and off-site transportation of these materials shall be performed in accordance with applicable requirements of the Connecticut General Statutes, the Regulations of Connecticut State Agencies and Titles 29 (OSHA), 40 (EPA), 49 (DOT) of the Code of Federal Regulations.
- **HOT WORK PERMIT SYSTEM:** A formal "Hot Work Permit" program is used as part of FCE's overall Fire Prevention Program. Hot work is any operation that introduces a potential ignition source, which in the presence of combustible or flammable materials can result in a fire. HOT WORK includes, but is not limited to, operations such as brazing, cutting, grinding, soldering, torching, and welding. The use of a Hot Work Permit is required for all hot work operations outside of designated hot work areas. Hot work can be performed without a permit only in areas specifically designated and posted as a "Hot Work" area.
- **LADDER SAFETY:** The use of ladders is to be done in compliance with the following OSHA standards:
 - 29 CFR 1910.25 - PORTABLE WOOD LADDERS
 - 29 CFR 1910.26 - PORTABLE METAL LADDERS
 - 29 CFR 1910.27 - FIXED LADDERS
 - 29 CFR 1910.29 - MANUALLY PROPELLED MOBILE LADDER STANDS & SCAFFOLDS

LOCKOUT TAGOUT PROGRAM: All servicing and maintenance of equipment is to be performed in accordance with the requirements of OSHA standard 29 CFR 1910.147 or 269 as applicable. These standards require locking out all potential energy sources prior to the performance of work.

- **PERSONAL PROTECTIVE EQUIPMENT:** In accordance with OSHA standard 29 CFR 1910.132-138 and Subpart I, work is to be performed using all necessary PPE. Hazard Assessments and Training in the use of required PPE are to be performed and documented prior to performance of work. PPE shall be removed before leaving the work area and disposed of according to waste management procedures to



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ensure that contaminants are not spread to personnel, through the facility(s), and/or to the environment.

- **POWERED INDUSTRIAL TRUCKS:** Forklifts and other industrial lift trucks are to be operated only by personnel trained in accordance with OSHA standard 29 CFR 1910.178.
- **POWERED PERSONAL LIFT TRUCKS:** Powered personal lift trucks are to be operated only by personnel trained in accordance with OSHA standard 29 CFR 1910.67 and 29 CFR 1926.453.
- **SAFETY DEVICES:** Equipment safety devices are not to be removed, bypassed or otherwise modified without review and approval by FCE EHS Dept.
- **SCAFFOLDING:** All use of scaffolding shall be in accordance with the following OSHA standards:
 - 29 CFR 1910.28 – "Safety Requirements for Scaffolding"

29 CFR 1910.29 – "Manually Propelled Mobile Ladder Stands & Scaffolds"

- **STORMWATER POLLUTION PREVENTION:** In accordance with the Connecticut Department of Environmental Protection (CTDEP) "General Permit for the Discharge of Stormwater Associated with Industrial Activity"; activities which will directly or indirectly release hazardous or non-hazardous materials into the storm water system are not permitted. All site practices will be to prevent or minimize pollution of stormwater. Operation of the fuel cell plant in and of itself does not invoke stormwater permitting requirements, however, fuel cells that are installed at and owned by a larger industrial facility may require registration under the General Permit. Construction phase stormwater permitting and compliance for this site, if applicable, is the responsibility of the Construction General Contractor.
- **WASTE MANAGEMENT:** FCE is to be notified in advance of all waste to be generated. Under state and federal rules, FCE, as the site operator, is the "Generator" of all waste generated/created on site(s). As such, FCE is responsible for the proper Management, Storage, Transportation and Disposal of all wastes generated at site. This is to be done in accordance with all applicable requirements of the Connecticut General Statutes, the Regulations of Connecticut State Agencies and Titles 29 (OSHA), 40 (EPA) and 49 (DOT) of the Code of Federal Regulations.
- **WORKING ALONE:** Working alone can introduce additional hazards not necessarily present during the course of performing work with other personnel. The biggest risk in working alone is during the occurrence of an incapacitating injury to the lone employee; a lack of timely medical attention could exacerbate the injury leading to greater harm. To prevent this, tasks must be assessed for hazards before assigning the employee(s) to perform them alone. If hazards do exist, either periodic monitoring, assignment of additional personnel, or re-



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scheduling of the work must be done. Further, it is important that task limitations be clear in order that new hazards are not introduced during any work performed alone. Employees performing work alone shall always contact GMCC by cell phone upon entering the facility site and upon leaving.

- **GENERAL DUTY CLAUSE:** The General Duty Clause of the Occupational Safety and Health Act requires that employers provide a place of employment that is free of recognized health or safety hazards to employees. It is FCE policy to provide such a workplace. Employees are encouraged to discuss any known or perceived health or safety issues or concerns with FCE management or EHS associates.

2 SITE SECURITY & ACCESS

Public access to the fuel cell equipment is restricted by its location at a private facility. Additional security is provided by the limited locked eight-foot-high chain link fence enclosure surrounding the plant. The enclosure is equipped with personnel and equipment doors or gates for necessary operator access. All doors/gates are kept locked when facility personnel are not present. Emergency Fire Department access to the site would be obtained by removing the lock with a bolt cutter.

All FCE power plants are remotely monitored 24 hours per day, 7 days per week, year-round by FCE's GMCC operations center. Any tampering or unauthorized manipulation of fuel cell components that would result in any significant performance change for the plant will be immediately detected by the GMCC operator and/or result in an Emergency Shutdown of the plant, restoring the plant to a safe condition. All FCE fuel cell power plants are designed for "fail-safe" operation, where all foreseeable process deviations have been considered and the consequences minimized, through a hazard and operability analysis.

EMERGENCY RESPONDER / LOCAL COMMUNITY COORDINATION & NOTIFICATION SYSTEM

FCE will coordinate with local emergency response departments to familiarize personnel with the operations and equipment installed at the site. At a point prior to plant mechanical completion, FCE will contact the Local Fire Department to schedule a walk around tour and training event for the near-completed installation. Either prior to or at this time, a compilation of Safety Data Sheets for chemicals used on the site can be provided to the Fire Department. EPCRA Section 311

During the construction phase, prior to a scheduled delivery of any piece of major equipment, the police department will be notified and contracted to manage and as required, control local traffic. Prior to connecting or making natural gas available at the facility, FCE will coordinate with the local fire department, provide training regarding the facility equipment and facility safety features, tour department personnel and provide a description of how the plant facility will respond should a fire, smoke, or volatile gas release occur.

FCE will record the names and contact information of those local residents that request to be informed of any actual emergency response situation that may develop at the subject



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power plant which may affect them. The names and contact information of the local residents will be incorporated into the Emergency Action Plan in the table provided for notification in an emergency response situation that could potentially affect these residents.

Responsibility for making such notifications will be the on-site manager during the construction phase of the project, and GMCC during the operation phase of the project.



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Appendix A West



South

North

The assembly area shall be North-West corner of parking lot for High Rise Hall

East