

Frequently Asked Questions 527 CMR 33 Hazardous Material Process or Processing

UPDATED WITH ADDITIONAL FAQ'S 8.2.2013 AND IDENTIFIED BY AN *

INTENT OF REGULATION

Review what hazardous materials are involved. If you are using only one hazardous material by itself and not adding energy (heating, pressurizing) to it, you may be exempt from the regulation.

You may not be exempt from the regulation if:

- *You are conducting a process, as defined by 527 CMR 33.*
- *The process can result in a fire or explosion hazard or health hazard at any time.*

527 CMR 33 defines Process or Processing: A sequence of operations in which the sequence can be inclusive of physical operations such as heating, cooling, mixing, distilling, compressing, and pressurizing, and chemical operations, such as polymerization, oxidation, reduction, and other chemical reaction processes, The sequence can involve but is not limited to: preparation, separation, combination, purification, or any actions that cause a change in state, energy content, or chemical composition.

The BFPR created a very broad definition of process. However, the background and intent of the regulation must be reviewed to determine its applicability. The regulation was created after several explosions at Massachusetts's facilities (PolyCarbon - Leominster, CAI/Arnel – Danvers, and Bostik - Middleton). These facilities were all mixing multiple chemicals together to create a change in the mixtures. These all involved energy input/removal or heating/cooling.

In response to these events, the regulation was developed, and is designed to cover chemical manufacturing and processing, for example, chemicals being mixed, where reaction energy is involved, and where heating or cooling takes place.

It is not the intent for this regulation to cover:

- Materials that are added to maintain certain conditions (i.e. treatments for cooling towers, boilers, chillers).
- The use of single products such as: liquid nitrogen, carbon dioxide systems
- The charging of batteries
- The use of hazardous materials as cleaning products when using rags or similar materials
- The mixing of hazardous materials in vehicles (trailers, cargo tanks, etc.) that are regulated by DOT

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AIR POLLUTION

527 CMR 33.01(3)(r) states that air pollution control devices that are a component of a process regulated by 310 CMR 7.00 are exempt from 527 CMR 33. What does the DFS mean by component? In some cases one air pollution control device services exhaust from a number of processes. Does it need to be directly connected to the process or can its intake be from general area exhaust (i.e., fugitive emissions) from the room in which the process is located?

This exemption would apply to processing within the air pollution control device. It can be either connected directly or indirectly to the various hazardous processes within the facility. Some examples are: scrubbers, catalytic oxidizers, thermal oxidizers, and dust collector/bag house.

It is understood that the intent of 527 CMR 33 is not to regulate the air pollution control devices (SCR) and as such an ammonia injection into the scrubber would be exempt. Some facilities have an intermediate step of vaporizing the aqueous ammonia prior to injection into the air pollution control devices (SCR) would this intermediate step be considered exempt?

It is felt that since this is part of the air pollution control equipment, it would be exempt from 527 CMR 33.

APPEALS

***What if you disagree with the Head of the Fire Departments decision?**

1. It is recommended that you set up a meeting with the local fire department to understand and discuss their decision. You may be required to supply additional information to assist their understanding of the process at the facility.

2. Massachusetts General Laws (MGL) ch. 22D s.5 establishes a means of appeal of decisions by officials charged with the enforcement of the state fire code. Such appeals are heard by the Fire Prevention Regulations Appeals Board and are limited to fire code matters relative to fire protection requirements for buildings. It is suggested that you consult with your attorney for appellate rights under the law. More information about the appeals board can also be found on the web at: <http://www.mass.gov/eopss/agencies/dfs/dfs2/osfm/boards-and-coms/fire-prevention-regulations-appeals-board.html>

APPLICABILITY

How does the storage of chemicals fit into the regulation?

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The storage of chemicals does not trigger the regulation. Chemical storage is covered in other sections of 527 CMR and/or 780 CMR.

How does one define the boundary of the regulation?

The regulation is driven by the vessel size for determination of a category. The boundary of the regulation will need to be determined by the competent professional and the appropriateness of good engineering and safe work practices.

How does one determine the vessel capacity?

For purposes of 527 CMR 33, the vessel capacity is the nominal capacity of the vessel as specified by the manufacturer.

How does the regulation deal with mixtures and dilution of chemicals?

For the purpose of 527 CMR 33, any chemical used in the process or produced by the process that has a rating by NFPA 704 of higher than 2 will require compliance.

How would you address gray water systems used to create gray water for irrigation and other non-potable uses?

It is not the intent to regulate the use of gray water systems for irrigation or other non-potable uses. It is exempt from the regulation.

I have a large outdoor oxygen tank, which feeds into a manifold system, also fed by natural gas from the utility company. These materials end up at rosebud type torches, which are used to heat very large pieces of metal. The metal is placed by overhead crane onto a large vertical spin lathe. As the metal spins and is heated by these multiple banks of torches, a ram is hydraulically pressed into the metal to shape it. Oxygen has a 3 on the NFPA label, as, I think, does natural gas. Since these materials feed torches is there an exemption to the permitting requirement?

This is exempt from 527 CMR 33.01(3)(i)

One of the byproducts of this combustion described above is NO_x (Nitric oxide has a 3 in the health NFPA section). The byproducts are emitted into the building and vented outside by the HVAC system. Is the building considered a vessel and therefore subject to permitting?

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The building is not considered a vessel and is therefore exempt from 527 CMR 33. Also review 527 CMR 33.01 (3) (r) Air pollution control devices that are a component of a process regulated by 310 CMR 7.00: Air Pollution Control for applicability.

Is it the intent to apply 527 CMR 33 to a facility that mixes No. 2 fuel oil with No. 6 fuel oil to operate by boiler on No. 4 fuel oil?

The Board feels this is outside the intent of the regulation, which is mixing various different hazardous materials. The main difference in the fuel oils is the viscosity of the product, not really the product. This is not considered to be covered by the regulation.

CATEGORY 3 HAZARD EVALUATION

The regulation for Category 3 process requires that a “hazard evaluation” be completed. What are considered generally accepted good engineering and safe work practices?

The evaluator should review applicable building code, fire code and consensus standards to complete the evaluation. Also, depending upon the process, the evaluator may find that the American Institute of Chemical Engineers has applicable resources.

DEPARTMENT OF PUBLIC HEALTH

Is ozone disinfection of biological matter a chemical, physical, or not a covered process?

They are regulated unless exempt by 527 CMR 33.01(3)(m) Biological and medical activities regulated by the Department of Public Health.

DEFINITIONS

Certain definitions are not standard industrial definitions making applicability determination difficult. For example, “corrosion” refers to the DOT definition, which describes dermal damage verified by testing the material on albino rabbits. Most facilities are not able to relate to this definition and are familiar with utilizing pH; similar to the definition in 310 CMR 30.123 to determine if a material is corrosive.

We have utilized standard building and fire code classification definitions. These definitions will ultimately determine your facility classification and are chosen to be in sync with those current definitions and codes.

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EMERGENCY RESPONSE PLANS

Does the floor plan that needs to be a part of an emergency response plan need to show the location of all hazardous materials, or just those that are in processes subject to 527 CMR 33?

It is recommended that all be shown.

When do we need to modify our emergency response plan?

The emergency response plan would need to be modified upon a change in category at the facility. It also needs to be reviewed for accuracy annually. During the annual permit application the responsible party is signing the application indicating compliance with this section.

EXEMPTION: CONSUMPTION OF FUEL

Electric power generators are already adequately regulated. Electric power generators are thoroughly regulated to review their operations, identify and correct hazards, and communicate the use of hazardous materials to employees, regulatory agencies, and the community. Below are samples of such regulations that are common to many electric power generators in Massachusetts.

- **Operation of power boilers in compliance with 522 CMR 2.00 with licensed Engineers and Operators under 522 CMR 18.00.**
- **Tanks and containers management in compliance with 527 CMR 9.00.**
- **Flammable and combustible liquids storage in compliance with 527 CMR 14.00.**
- **Facilities in compliance with 310 CMR 50.00 Toxics Use Reduction (see *Toxics Use Reduction Plan* requirements 310 CMR 50.40 thru 50.49).**
- **Compliance with 454 CMR 21.00 “Right to Know” Law (Hazard Communication).**
- **Compliance with 310 CMR 33.00 Employee and Community Right to Know.**
- **Compliance with OSHA 29 CFR 1910.1200 Hazard Communication Standard.**
- **Compliance with OSHA 29 CFR 1910 Subpart H – Hazardous Materials Standards, which includes Process Safety Management of Highly Hazardous Materials (1910.119) and Hazardous Waste Operations and Emergency Response (1910.120)**
- **Additionally, there are numerous other OSHA standards that regulate worksite operations.**

Therefore, we request that the following language be added to 33.01(3) as an exemption:

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(u) Electric power generating facilities which operate boilers in compliance with 522 CMR 2.00 with licensed Engineers and Operators under 522 CMR 18.00, per MGL c. 146, §48 Licensing of Engineers and Firemen.

To the extent that an exemption for electric power generating facilities is not granted, then these additional concerns must be addressed:

It is the intent of 527 CMR 33.03(3)(i) that such facilities are exempt from the regulation.

The proposed Massachusetts Hazardous Material Process or Processing regulation appears overly broad in its scope and very difficult to determine applicability. The proposed rule captures facilities with no minimum hazard threshold, thereby including all facilities that utilize hazardous materials in any quantity.

Correct, there are no minimum thresholds. Once a category is determined the analysis completed should be comparison to the hazard present.

The definition for “Process or Processing” is unclear. For example, is combustion of natural gas considered a red-ox reaction and therefore a process?

It is important to review the exemptions outlined in 527 CMR 33.03(3) in particular 33.03(i).

A unit generator, boiler or combustion turbine that is permitted to combust fuel in accordance with 310 CMR 7 has ancillary activities such as a heated natural gas line (regulated by 248 CMR), natural gas compression or heated fuel oil lines. Are these ancillary activities exempt from 527 CMR 33?

If these ancillary activities are directly related to the consumption of fuel they would be considered to be exempt from 527 CMR 33.

EXEMPTION: POTABLE WATER/WASTE WATER

The storage of four 5-gallon carboys of 65% nitric acid exceeds the H-occupancy. Does this allowance for this control area and trigger a Category 3 process? If so, a Category 3 process is required to comply with the OSHA Laboratory Safety Standard, develop an emergency response plan, obtain a permit for this process from the local fire department, conduct a Category 3 Hazard Evaluation, develop a hazard evaluation policy, and implement process safety controls to mitigate hazards associated with normal and abnormal operations.

The regulation 527 CMR 33 does not trigger or become applicable based upon the storage. The regulation triggers a Category based upon the process and the vessel size.

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A facility with four 80-gallon cation/anion beds in sequence and regenerated with 35% hydrochloric acid would be classified as a Category 4 process and requires a Process Safety Management-like program.

Exempt by 527 CMR 33.01(3)(g) The processing or treatment of potable water and sanitary wastewater.

Is pH adjustment and water purification exempt from 527 CMR 33?

*Under 527 CMR 33.01 (3) the following exceptions apply:
527 CMR 33.01 (3)(g) The processing or treatment of potable water and sanitary waste water;
527 CMR 33.01 (3)(h) Wastewater treatment operations that operated by Grades II, IM, 2I and 2M operators as classified according to 257 CMR 2.00: Certification of Operators of Wastewater Treatment Facilities;*

The definition of sanitary waste water from DEP is: wastewater as sewage, industrial waste, other wastes or any combination of the three. Water from the washing of vehicles, machinery, materials, products, equipment, and/or buildings with detergents or other cleaning agents that is part of the ordinary operations of a commercial or industrial enterprise or a local government unit is wastewater.

The pH adjustment prior to the discharge to the environment is not considered processing.

Are rinse tanks covered by 527 CMR 33? The product is lastly dipped into these water or rinse water tanks to clean off any residues.

No, it is not the intent of the BFPR to cover rinse tanks.

EXEMPTION: PREMIXED PRODUCTS THAT ARE DESIGNED OR LABELED AND PREPACKAGED FOR SALE TO THE CONSUMER

Are janitorial activities, such as mixing of cleaning solutions, considered a covered process?

Products that are designed to be pre-mixed in accordance with the manufacturer's instructions or products that are labeled and packaged for sale to the consumer at retail would be exempt from the regulation.

Does a facility that mixes a gallon of 2-part epoxy as a routine maintenance event be require to comply with the OSHA Laboratory Safety Standard and develop an emergency response plan under the Category 1 requirements?

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527 CMR 33.01(3) may address this by exemption. The exemptions that may apply are copied below for your convenience – refer to the full list in the regulation.

527 CMR 33.01(3)(b) Construction and maintenance projects regulated in accordance with 527 CMR 14.00: Flammable and Combustible Liquids, Flammable Solids or Flammable Gases;

527 CMR 33.01(3)(c) Products that are designed pre-mixed in accordance with the manufacturer's instructions or products that are labeled and packaged for sale to the consumer at retail;

Are painters utilizing a 5-gallon pressure sprayer of muriatic acid required to comply with the OSHA Laboratory Safety Standard, develop an emergency response plan, and obtain a permit for this process from the local fire department under Category 2 requirements?

527 CMR 33.01(3) may address this by exemption – more information is needed. The exemptions that may apply are copied below for your convenience – refer to the full list in the regulation.

527 CMR 33.01(3)(c) Products that are designed pre-mixed in accordance with the manufacturer's instructions or products that are labeled and packaged for sale to the consumer at retail;

527 CMR 33.01(3)(c) says:

**Products that are designed pre-mixed in accordance with the manufacturer's instructions or products that are labeled and packaged for sale to the consumer at retail;
What does this section apply to or mean?**

The Board takes a broad approach to this section. There are many products that are available on the market today that are packaged and sold for both the consumer and commercial application. As long as these products are used in accordance with the manufacturer's instructions and no additional products are added, they would fall into the category of exemption. This would include, for instance:

1. The use of a commercial grade two-part epoxy. The mixing of the epoxy is an exothermic reaction. This would be exempt from the regulation under 527 CMR 33.01(c)(3). "Products that are designed pre-mixed in accordance with the manufacturer's instructions".

2. The use of industrial cleaners that require dilution or mixing in accordance with manufacturer's instruction. This would be exempt from the regulation under 527 CMR

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33.01(3)(c). *"Products that are designed pre-mixed in accordance with the manufacturer's instructions"*

Does the application of spray foam insulation require permitting under 527 CMR 33?

This type of application is not regulated by 527 CMR 33, the Board feels that 527 CMR 33.01(3)(c) Products that are designed pre-mixed in accordance with the manufacturer's instructions or products that are labeled and packaged for sale to the consumer at retail is applicable, as the Board looks at the retail in a broad sense.

A company ships products ready to be used or ready to be diluted and used by professional car washes and professional car detailers. Their labels say "FOR COMMERCIAL USE ONLY". Are the car detailers, car washers exempt under 527 CMR 33 or are they covered under 527 CMR 33?

527 CMR 33.01(3)(c) says:

Products that are designed pre-mixed in accordance with the manufacturer's instructions or products that are labeled and packaged for sale to the consumer at retail;

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1. The use of a commercial grade two-part epoxy. The mixing of the epoxy is an exothermic reaction. This would be exempt from the regulation under 527 CMR 33.01(3)(c). "Products that are designed pre-mixed in accordance with the manufacturer's instructions".

2. The use of industrial cleaners that require dilution or mixing in accordance with manufacturer's instruction would be exempt from the regulation under 527 CMR 33.01(3)(c). "Products that are designed pre-mixed in accordance with the manufacturers Instructions"

FOOD PROCESSING FACILITIES

Does the regulation cover a food manufacturer or processor?

Yes, it is the intention that possibly a food manufacturer or processor could be included. It is recommended that the following questions be answered to determine if you are required to comply with this regulation or not.

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1. Do you use a hazardous material, as defined by 527 CMR 33?
2. Do you process this hazardous material, as defined by 527 CMR 33?
3. Are you exempted by 527 CMR 33.03?
4. If not, what is your vessel size (where the process takes place). This answer will provide your category. Once this is known, you can review your requirements for compliance.

In reviewing this question, it is important to look at the hazard associated with the process to determine the extent of the review necessary.

Does the regulation cover a process that makes flavored water? We add a flavoring chemical that carries a NFPA 704 rating of 3 to water.

Yes, your process could be covered. It is recommended that the following questions be answered to determine if you are required to comply with this regulation or not.

1. Do you use a hazardous material, as defined by 527 CMR 33?
2. Do you process this hazardous material, as defined by 527 CMR 33?
3. Are you exempted by 527 CMR 33.03?

If not, what is your vessel size (where the process takes place). This answer will provide your category. Once this is known, you can review your requirements for compliance.

In reviewing this question, it is important to look at the hazard associated with the process to determine the extent of the review necessary.

HIGH HAZARD OCCUPANCY

The definition of a Category 3 process includes “a process area that is classified as being H Occupancy as defined by 780 CMR: Massachusetts State Building Code.” However, if the space is H Occupancy is based on storage of materials not process operations, does this mean that storage is a determining factor in applicability of 527 CMR 33 – especially for Category 3 processes?

No, typically the storage of tanks, cylinders and containers are not considered in determining the category of a process. However, a Category 3 Process, as defined in 527 CMR 33 is: A process which involves or produces a Hazardous Material which occurs in a vessel that is greater than 60 gallons but is less than or equal to 300 gallons or a process area that is classified as being a H Occupancy as defined by 780 CMR: Massachusetts State Building Code. In this case one must look at the process area to determine if they have exceeded the exempt amounts of the building code (307.1(1) and (2)) for the process area would categorize this as a category 3 process or area. It is anticipated that the hazard evaluation would take the connection of the storage and vessels into account.

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In some cases an H Occupancy area can contain a number of processes. For instance, a semiconductor fab is likely an H Occupancy and a fab can contain hundreds of tools or processes. Does this mean that all the processes in this area are Category 3 processes subject to the requirements of 527 CMR 33?

Yes, all the processes would be required to comply with the category 3 hazard evaluation. However, it may be the same evaluation and policy. In determining what needs to be reviewed it must be within the purpose and scope of CMR 33. When completing a category 3 hazard evaluation adjacent vessels must be considered and the extent of the evaluation should be dependent upon the processes.

HOSPITALS

Please confirm that activities (processes) at hospitals are exempt per 527 CMR 33.01(3)(d).

Hospitals are not exempt from 527 CMR 33. 527 CMR 33.01(3)(d) refers to the activities of healthcare professional offices or facilities under the supervision of a licensed medical doctor, dentist or veterinarian. The intent of this section is to recognize minimal testing and mixing could take place in an office environment. Hospitals could have offices of this type within their environment, but are not automatically exempt. For instance, a laboratory used to complete all their testing would be covered by 527 CMR 33.

How would you address ETO sterilizers in hospitals?

If the ETO sterilizer is the release of ETO gas into a containment enclosure and the evacuation of the ETO, it would be exempt, as no "process" is taking place.

INERT GAS

How would you address the compressing of CO₂?- The CO₂ is in liquid form in the tank outside of the building, it gets converted to a gas to be transferred by pipe into the building where it is compressed back into a liquid for the use in a lab.

The process described appears to be covered by exemption (p) Use of inert gas

MISCELLANEOUS

If the fire service finds that an existing process is not compliant to 527 CMR 33, will the facility be allowed to operate the process while it is addressing issues to come into compliance?

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It will be up to the AHJ to determine if these processes are allowed to continue based upon the hazard(s) identified.

We lease a nitrogen generation plant from a vendor to supply nitrogen gas needed for our production operations. The operation, maintenance, and monitoring of the plant is conducted by employees of this vendor. We only provide a source of electricity to power the unit.

- **Is the owner operator of the process required to obtain permit?**
- **Can the facility owner not directly involved with the process obtain a permit?**

The process described appears to be covered by exemption (p) Use of inert gas or (n) Handling and use of liquid nitrogen cooling systems at atmospheric pressure. Therefore, exempt from permitting.

Can a facility (itself) be considered a process? For example, a plating company has one large dipping tank that run throughout its building.

The vessel holding the hazardous material determines the category and permit.

How would you address the cleaning of a tank/vessel? They introduce and mix several chemicals to clean the vessels between batches.

The cleaning described above would be captured under the regulation. However, the hazard analysis should be contingent to the hazard involved.

How would you address a facility with no normal processes - only process being when they hire a contractor to clean their tanks multiple times a year?

The cleaning described above would be captured under the regulation. However, the hazard analysis should be contingent to the hazard involved.

How would you address the increasing/decreasing concentrations? For example, the regeneration of acids.

The process described above would be captured under the regulation. However, the hazard analysis should be contingent to the hazard involved.

If I have a process tool with three sinks (three separate compartments/vessels), do I consider the volume of each sink to categorize the process or do I aggregate the volume of all three sinks to determine the category of the process? Is each sink considered a process? What happens if the sinks were connected (e.g., piped together)?

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As described above, each sink is a separate vessel.

NFPA 704 RATINGS

Chemicals are sometimes rated differently. For instance, the new Global Harmonization Standards and HMIS are slightly different than NFPA 704 rating. How would those ratings apply to the regulation?

527 CMR 33 has utilized the NFPA 704 system for determining hazards of chemicals used in, or produced by, processes. Chemical hazard rating documentation by other systems will need to be converted to the NFPA 704 hazard rating to determine applicability of 527 CMR 33. There are several hazard rating system comparisons available on the Internet.

NEW EQUIPMENT

Regulated entities need to notify the fire service prior to a change (new or modification of existing process), which may qualify as a Category 1-5 process? How far in advance of installation of the process does this notification be made? (i.e., How much time should be allotted in the entity's planning process for the fire service to inspect and grant the permit?)

Since most of these changes in category require building plans and permits. It is recommended that this discussion take place at the time the building permit is being applied for. If it doesn't require a permit, this should be considered and dealt with early on in the management of change process.

OSHA vs. STATE REGULATION

Part of the requirements for facilities with processes in Categories 2-5 are based on some Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) standards and regulations such as 29 CFR 1910.1200 (Hazard Communication), 29 CFR 1910.1450 (Chemical Hygiene), 29 CFR 1910.119 (Process Safety Management of Highly Hazardous Chemicals), and 40 CFR Part 60 (Chemical Accident Prevention Provisions). Since the fire service is not typically involved in the enforcement of these regulations, how will the fire service performing the inspections and granting the Hazardous Materials Processing Permit assess compliance with these regulations?

The facility is responsible for compliance with the appropriate sections of the regulation and its identification to the fire department. The Department of Fire Services staff has had several meetings with all three OSHA area offices. We have agreed to a referral program between our offices for the various categories and any compliance issues.

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If the fire service believes that the facility is not in compliance with the above noted regulations, can the facility continue to operate an existing process while it takes corrective actions to come into compliance or while it collects evidence to demonstrate that it is compliant?

The local and state officials have different authority than OSHA. It will be up to the AHJ to determine if these processes are allowed to continue based upon the hazard identified. Any concerns at the local or state level regarding compliance with the federal regulations will be referred to OSHA/EPA, as necessary.

The overall objective of the proposed rule is unclear in light of already existing rules and regulations that are designed for a similar if not identical objective.

Other rules such as the federal Occupational Safety and Health Administration's (OSHA) Process Safety Management, US Environmental Protection Agency's Risk Management Plan, and MA Employee and Community Right to Know Act accomplish similar objectives of informing emergency response personnel and the community of hazards in the workplace.

The goal in creating 527 CMR 33 was to review current regulations and allow compliance with those regulations to possibly exempt you or in complying with those be transferrable to this regulation without additional work, thereby creating a way to achieve compliance more easily. The rationale behind the development of CMR 33 was to focus on facilities that do not need to comply with OSHA or EPA RMP.

If the FD permits are annual, for Cat 4 processes it requires internal reviews at 3 years. What is an internal review?

If a facility is stagnant (runs a consistent process) An internal review is required every three years to make sure that no changes have taken place with the process and that the original review is still applicable (no changes in products, amounts, pressures, etc.)

A Cat 5 process requires an internal review every 3 years. OSHA requires re-evaluation every 5 years - Therefore are you essentially requiring the OSHA re-evaluation to be every 3 years?

A category 5 process compliance requires certification with the OSHA or EPA standard. The category 5 process does not require compliance with the previous category like all the other processes.

Is an analysis required for this actual incident? A cat 4 process. A non-reportable release of a haz-mat into a retaining basin that set off the smoke detectors and a FD response?

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The regulation states: In the event of an incident involving a process in which there is fire department, EMS response, or a reportable release of a hazardous material, a written post incident analysis must be initiated within 48 hours. The key is it is only required when it involves the process.

OVENS/FURNACES

I have an industrial oven that processes a fabric coated with a NFPA 704 class 4 flammable liquid. Since there is heat applied and it involves a class 4 liquid does 527 CMR 33 apply to this?

527 CMR 33 does not apply to this “process.” 527 CMR 10.19 Ovens and Furnaces along with the appropriate NFPA standard are the applicable regulations covering the process in ovens and furnaces.

Are processes in ovens and furnaces regulated under 527 CMR 33?

Ovens and furnaces that are covered by NFPA 86 and 527 CMR 10 are not considered to be part of 527 CMR 33. The requirements for ovens and furnaces are below.

527 CMR 10.19: Ovens and Furnaces

(1) Scope. 527 CMR 10.19 shall apply to all ovens and furnaces involving a fire or explosion hazard by reason of the temperatures at which the oven or furnace is operated; the fuel that is used; the presence of a flammable volatile from materials in the oven, furnace or combustion system; or a combination of the fuel and the flammable volatiles.

(2) Permit required. A permit shall be obtained from the head of the fire department to operate an oven or furnace to which 527 CMR 10.19 applies.

(3) Requirements.

(a) The appropriate standards are: NFPA 86, NFPA 86C, and NFPA 86D.

(b) Furnaces consisting of heated enclosures operating at approximately atmospheric pressure, which use a special processing atmosphere within the furnace, and vacuum furnaces, shall require approval.

It is not the intent of the BFPR to require additional permitting of ovens and furnaces under 527 CMR 33, as they are clearly regulated under the existing fire code.

Is the dipping of a printed item into a 5 gallon bucket of solvent (NFPA rating of 2 or more) to remove the residue considered a process?

No, the definition of process is: A sequence of operations in which the sequence can be inclusive of physical operations such as heating, cooling, mixing, distilling, compressing, and pressurizing, and chemical operations, such as polymerization, oxidation, reduction, and other

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chemical reaction processes, The sequence can involve but is not limited to: preparation, separation, combination, purification, or any actions that cause a change in state, energy content, or chemical composition.

However, the evaporation of the use and handling of the solvent from the dipped item may need further review under 527 CMR 14 and/or NFPA 30.

Is the melting of solid lead into lead ingots considered a process?

It does not appear to be covered by 527 CMR 33. This appears to be covered by 527 CMR 10 and NFPA 86 on ovens and furnaces. There may be other health concerns with this process and regulations/oversight.

A material is sprayed with a glazing and then fired in an oven? Is this a process?

It does not appear to be covered by 527 CMR 33. This appears to be covered by 527 CMR 10 and NFPA 86 on ovens and furnaces.

A company makes a ‘biscuit’ comprised of materials with an NFPA rating of 2 or more. This biscuit gets cured in an oven. Is this considered a process?

It does not appear to be covered by 527 CMR 33. This appears to be covered by 527 CMR 10 and NFPA 86 on ovens and furnaces.

Is a slurry (with a material with a NFPA rating of > 2) that is placed in a tray that is placed into a drying oven considered a process?

It does not appear to be covered by 527 CMR 33. This appears to be covered by 527 CMR 10 and NFPA 86 on ovens and furnaces.

PERMITS

What is the anticipated turn around time for permitting at the local level?

The turn around time can vary at the local level. It is recommended that you check with the local fire department.

For additional information on compliance with 527 CMR 33.04 and its deadlines.

*527 CMR 33.04(2) An applicant for the permit required by 527 CMR 33.04 shall submit an application for Permit to Process Hazardous Material to the Head of the Fire Department on a form prescribed by the Fire Marshal. **A facility shall be deemed in compliance with the permit requirements of 527 CMR 33.04, if a completed application form, signed and attested***

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by the applicant has been filed in accordance with the schedule stated in 527 CMR 33.04(3) and said application is pending review and approval by the head of the fire department.

527 CMR 33.04(3) (a) The application for permit to process hazardous materials shall be submitted in accordance with the following schedule:

- 1. January 1, 2013 Category 5 Hazardous Processes*
- 2. June 1, 2013 Category 4 Hazardous Processes*
- 3. January 1, 2014 Category 2 and Category 3 Hazardous Process*

What is the permit fee going to be?

Permit fees are regulated by MGL 148 s. 10A.

Can you operate as long as you have submitted an application? For example, the company submits an application a day before the deadline.

The regulation requires that a company submit the application by the dates specified in the regulation. We encourage facilities to submit the applications, as soon as possible, to avoid a last minute flood of applications to the local fire department.

What happens if the application is given on-time, the operation starts, but the FD rejects the application?

I would suggest the first goal is for the fire department and applicant to begin communications to clearly understand the denial of the application. At this point, it is a normal process for the fire department to handle this as any other compliance activity with the goal to bring the facility into compliance.

What are the violations - civil or criminal?

This would be handled, as any other normal compliance activity.

What will be the punishments for failing to comply?

This would be handled as any other normal compliance activity.

Will the fire departments require multiple permits?

During the phase-in time it is anticipated that multiple permits could be issued based upon the category. It is highly recommended that after full phase in a single permit be issued to the facility.

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How long do the permits last for?

According to 527 CMR 33, permits must be renewed annually.

What is meant by ‘the facility maintains and implements a policy in compliance with 527 CMR 14.00’?

This means that the company has a process to oversee what is taking place at the facility and ensures that the quantity, use, handling and introduction of new products that are flammable and combustible materials are always in compliance with the permitting and land license requirements of 527 CMR 14.

Per 527 CMR 14.01(2) – if a process is covered by 527 CMR 33.00, then 527 CMR 14.00 does not apply?

This is not correct. This is in reference to other standards that have specific criteria that over rules the permit, licensing or handling/use requirements in CMR 14. For example, 527 CMR 6 sets a different permit, land license threshold for the storage of LP gas and handling/use criteria.

REMEDICATION OF SOIL AND GROUNDWATER

The Use of Methanol for Remediation of Soil and Groundwater

Methanol (NFPA 704 rating of 3) is used as a remedial additive to enhance the effectiveness of soil and groundwater remediation. Generally speaking it is used as an enhancement to “flush out” contamination that is bound in the soil, which is then captured by some other means (for example a pump and treat system).

All remediation activities, including application of remedial additives, are regulated by Massachusetts General Law 21E (MGL 21E) and the Massachusetts Contingency Plan (310 CMR 40.0000 or the MCP). The MCP specifically calls out the application of remedial additives in 310 CMR 40.0040 through 310 CMR 40.0047. This section requires a report on all activities with remedial additives be submitted to the Massachusetts Department of Environmental Protection on 6 month intervals after injection.

The application of remedial additives, like methanol, is conducted under the supervision of a Licensed Site Professional (LSP) and executed by HAZWOPER trained personnel (29 CFR 1910.120).

For a given application, methanol is received in 55-gallon DOT drums. The drums are grounded, and the methanol is transferred by an intrinsically-safe (XP) drum pump to a

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polyethylene holding tank (approximate 500 gallon capacity) that has been pre-filled with water to create an approximate 80/20 solution of water and methanol. This mixing process is conducted outdoors.

Once the mixing is complete, the water/methanol solution is injected into vertical injection wells at depths greater than 10 feet below ground surface using a centrifugal pump. Monitoring and extraction wells down gradient of the injection are then sampled over time to assess the effectiveness of the injection.

More information would need to be collected to properly answer this question; however, for guidance in answering this question, it is not the intent of 527 CMR 33 to cover injections into wells as you have indicated. The process of mixing water and methanol may be covered. The scoping language in 527 CMR 33 and definitions need to be reviewed and applied to this situation to determine if it is covered or not.

527 CMR 33.01 (1) The purpose of 527 CMR 33.00 is to:

527 CMR 33.01(1)(a) Protect the public and emergency response personnel from fire or explosion hazards arising out of the processing of flammable, combustible, toxic, or corrosive substances.

527 CMR 33.01(b) Enhance the awareness of local emergency response personnel about the actual or potential hazards and risks associated with hazardous material processing that occurs within their community;

527 CMR 33.01(c) Establish permitting requirements for facilities that engage in the processing of hazardous material;

527 CMR 33.01(2) The provisions of 527 CMR 33.00 shall apply to both new and existing facilities that process hazardous materials.

527 CMR 33.02 Definitions

Facility: a structure, building or complex of buildings where Hazardous Materials are processed.

SCHOOLS

How would you address private/public school laboratories?

Each school would need to be reviewed, but most school laboratories are covered by Category 1 of the regulation.

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STORAGE vs. PROCESS

Are tanks, cylinders, and containers of hazardous materials with an NFPA 704 rating of 3 or 4 connected to the process remotely considered a part of the process, and therefore vessels subject to the requirements of this regulation? Examples would include:

Storage of tanks, cylinders and containers are not considered in determining the category of the process. The tank, cylinder and container and their connections may have to be reviewed during the category 3 hazard evaluation or category 4 limited process safety analysis, if it is determined to be within those categories.

Liquid oxygen or liquid nitrogen or hydrogen tanks outside the facility (typically in excess of 300 gallons capacity) that are piped to a process or processes inside the facility.

Storage of tanks, cylinders and containers are not considered in determining the category at the process. The tank, cylinder and container and their connections may have to be reviewed during the category 3 hazard evaluation or category 4 limited process safety analysis, if it is determined to be within those categories.

Silane in cylinders in a bunker or storage room inside or outside the facility that are piped to manufacturing processes - this assumes that the structure (bunker or storage room) meets the requirements of the Massachusetts Building Code.

Typically, the storage of tanks, cylinders and containers are not considered in determining the category of a process. However, a Category 3 Process, as defined in 527 CMR 33 is: A process which involves or produces a Hazardous Material which occurs in a vessel that is greater than 60 gallons but is less than or equal to 300 gallons or a process area that is classified as being a H Occupancy as defined by 780 CMR: Massachusetts State Building Code. In this case one must look at the process area to determine if they have exceed the exempt amounts of the building code (307.1(1) and (2)) for the process area would categorize this as a category 3 process or area. It is anticipated that the evaluations would take the connection of the storage and vessels into account.

A toxic or flammable gas such as arsine or hydrogen in cylinders in a gas cabinet that is piped to a process in another location.

Typically, the storage of tanks, cylinders and containers are not considered in determining the category of a process. However, a Category 3 Process, as defined in 527 CMR 33 is: A process which involves or produces a Hazardous Material which occurs in a vessel that is greater than 60 gallons but is less than or equal to 300 gallons or a process area that is classified as being a H Occupancy as defined by 780 CMR: Massachusetts State Building Code. In this case one must look at the process area to determine if they have exceed the exempt amounts of the building code (307.1(1) and (2)) for the process area would categorize

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this as a category 3 process or area. It is anticipated that the evaluations would take the connection of the storage and vessels into account.

Flammable liquid in containers in a flammable storage room (meeting the requirements of the Massachusetts Building Code and the DFS Fire Prevention Regulations) that is piped to a process that is located outside of the flammable storage room.

Typically, the storage of tanks, cylinders and containers are not considered in determining the category of a process. However, a Category 3 Process, as defined in 527 CMR 33 is: A process which involves or produces a Hazardous Material which occurs in a vessel that is greater than 60 gallons but is less than or equal to 300 gallons or a process area that is classified as being a H Occupancy as defined by 780 CMR: Massachusetts State Building Code. In this case one must look at the process area to determine if they have exceed the exempt amounts of the building code (307.1(1) and (2)) for the process area would categorize this as a category 3 process or area. It is anticipated that the evaluations would take the connection of the storage and vessels into account.

We have a bulk storage tank for liquid nitrogen located on the exterior of the building. The pressure within the tank is 30-35 lbs. The tank uses a pressure builder/vaporizer (liquid nitrogen transitions to nitrogen gas within this unit) located on the exterior of tank to control delivery of liquid nitrogen and pressure of nitrogen gas.

- **Is the pressure builder/vaporizer considered a process vessel?**

The process described appears to be covered by exemption (p) Use of inert gas or (n) Handling and use of liquid nitrogen cooling systems at atmospheric pressure.

Liquid nitrogen is delivered to various pieces of test equipment located within the manufacturing operations via vacuum jacketed pipe. Typically the test equipment contains a solenoid valve that allows for control of liquid nitrogen entering a manifold. When the valve opens liquid nitrogen enters the manifold and transitions to cold nitrogen gas, which is then dispersed into the test chamber.

- **Is the manifold considered the vessel for purposes of determining category of process?**

The process described appears to be covered by exemption (p) Use of inert gas or (n) Handling and use of liquid nitrogen cooling systems at atmospheric pressure.

We have a fill station, which allows us to draw out liquid nitrogen from bulk storage tank and place into portable cryogenic liquid containers. These are cryogenic liquid containers with double-walled, vacuum-sealed vessels with multilayer insulation in the annular space. They are designed for the transportation and storage of liquefied nitrogen. These

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portable containers are then rolled to various locations for use in supplying liquid nitrogen for use in cold test equipment.

- Is the fill procedure considered handling or a process?
- If this transfer is considered to be a process, is the size of potable container equivalent to vessel size in determining proper category of process?

The process described appears to be covered by exemption (p) Use of inert gas or (n) Handling and use of liquid nitrogen cooling systems at atmospheric pressure.

My company is engaged in fuel cell and hydrogen generation research. We have a hydrogen storage system on-site that compresses hydrogen to 6,000 psig”. Is the compression of hydrogen covered by 527 CMR 33?

Yes, this is covered by 527 CMR 33.

*** I have a large liquid oxygen tank for storage (which is exempt from 527 CMR 33), but this tank is connected by piping to a vaporizer which is used to change the liquid to a gas and is then piped throughout the building for use. The NFPA 704 rating for liquid oxygen is “3”. Is this considered a process under 527 CMR 33?**

Yes, this activity is covered under 527 CMR 33 as a process. Oxygen is classified as an oxidizer. The size of the vaporizer, which is where the process takes place, is considered the vessel. The size of the “vessel” will determine the process category.

Some resources to consider are NFPA 55, NFPA 99 and Compressed Gas Association.

THIRD PARTY REVIEW

Would a third party evaluation of the process be helpful if it is submitted to the fire service with the permit application?

Although not required a 3rd party evaluation submitted with the application would most likely be helpful to the fire service.

VESSELS

Regarding processes that are a tool or a system rather than a single container, what is the “vessel” you would use to determine applicability? For example: 1) What part of an ammonia refrigeration system qualifies as the “vessel” that would be used as to categorize the process? Is it the whole system? Is it the volume of the refrigeration compressor?

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The intent of 527 CMR 33 is to cover the process. 527 CMR 33 defines Vessel as “The container in which partial or the actual process takes place. Examples of vessels are beakers, pails, tanks, reactor kettles, pipe reactors, and drums. The size of a vessel is its capacity”.

However, a Category 3 Process, as defined in 527 CMR 33 is: A process which involves or produces a Hazardous Material which occurs in a vessel that is greater than 60 gallons but is less than or equal to 300 gallons or a process area that is classified as being a H Occupancy as defined by 780 CMR: Massachusetts State Building Code. In this case one must look at the process area to determine if they have exceed the exempt amounts of the building code (307.1(1) and (2)) for the process area would categorize this as a category 3 process or area. It is anticipated that the hazard evaluation would take the connection of the storage and vessels into account.

In the semiconductor industry there are tools that are called ion implanters that use gases like arsine and phosphine. The tools are the size of a room. What is the vessel – only the part in which the gas is contained in?

The intent of 527 CMR 33 is to cover the process. Vessel: The container in which partial or the actual process takes place. Examples of vessels are beakers, pails, tanks, reactor kettles, pipe reactors, and drums. The size of a vessel is its capacity. However, a Category 3 Process, as defined in 527 CMR 33 is: A process which involves or produces a Hazardous Material which occurs in a vessel that is greater than 60 gallons but is less than or equal to 300 gallons or a process area that is classified as being a H Occupancy as defined by 780 CMR: Massachusetts State Building Code. In this case one must look at the process area to determine if they have exceed the exempt amounts of the building code (307.1(1) and (2)) for the process area would categorize this as a category 3 process or area. It is anticipated that the hazard evaluation would take the connection of the storage and vessels into account.

If the hazardous material in these processes are not liquids, but rather a gas or a solid, how does one calculate the volume to determine which category the process falls into?

However, a Category 3 Process, as defined in 527 CMR 33 is: A process which involves or produces a Hazardous Material which occurs in a vessel that is greater than 60 gallons but is less than or equal to 300 gallons or a process area that is classified as being a H Occupancy as defined by 780 CMR: Massachusetts State Building Code. In this case one must look at the process area to determine if they have exceed the exempt amounts of the building code (307.1(1) and (2)) for the process area would categorize this as a category 3 process or area. It is anticipated that the hazard evaluation would take the connection of the storage and vessels into account.

How does one categorize a process tool like a wet etching tool that can have more than one vessel in it? Would the tool (i.e. process) be categorized by the volume of the largest vessel that contains a hazardous material with an NFPA 704 rating of 3 or 4?

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Yes, all the processes would be required to comply with the category 3 hazard evaluation. However, it may be the same evaluation and policy. In determining what needs to be reviewed it must be within the purpose and scope of CMR 33. When completing a category 3 hazard evaluation adjacent vessels must be considered and the extent of the evaluation should be dependent upon the processes.

How would you address the mixing of products in a pipe (2 pipes going into 1) prior to going into tanks?

Where two hazardous materials are mixed in a pipe, the pipe is considered the vessel. The pipe from time of the products being introduced till full mixture is the “vessel”. The volume of the pipe dictates the category.

If I have a 10k gallon vessel, however for economic reasons I am using less than the vessel's capacity can I base my hazard category on the actual usage of the vessel or must I use the vessel's maximum capacity?

The regulation requires that the vessel’s capacity dictate the hazard category. So even if you are using less than a “full” vessel, the vessel capacity is the driving factor.

***I have an ice rink that has an ammonia refrigeration system. It is clear that the regulation does not provide an exemption for refrigeration systems using ammonia. Our system is not large enough to be regulated by 40 CFR Part 68, EPA RMP. I do not see any definitive criteria for evaluating the applicability and categorization of ammonia refrigeration systems.**

First, the description provided, indicates that the ammonia refrigeration system is regulated by 527 CMR 33. The BFPR has determined that the entire refrigeration system is considered the “vessel” and based on the size will provide the category classification. Some things to consider in the evaluation: sprinkler protection for the tanks, gas detection in the event of a leak, automatic shutdown equipment and all the associated maintenance activities. A few standards to use as guidance: G-2.1, American National Standard Safety Requirements for the Storage and Handling of Anhydrous Ammonia (ANSI K61.1), other national standards and guidelines may be available.

WELDING AND SOLDERING OPERATIONS

With respect to welding and soldering operations, I understand that consumption of fuels to operate equipment (such as torches for welding and cutting) is exempt from the regulation pursuant to 527 CMR 33.01(3) (i). However, aside from the consumption of

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fuels, is the welding or soldering activity itself subject to the regulation if a flux is used that has an NFPA hazard rating of "3"?

This section of the regulation is intended to exempt the soldering portion as well. However this operation is regulated under 527 CMR 39.