Activities of the DOE Sub-Surface Working Group

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DOE Sub-Surface Working Group Activities

Overview

- The Sub-Surface Working Group (SWG) was formed from the May 15, 2012 Fire Safety Committee Meeting.
- A draft report was sent to the DOE in January, 2014.
- This presentation reviews the SWG Activities and report recommendations

DOE Sub-Surface Working Group Activities

SWG Members

Jim Bisker (DOE-HQ, Lead)

Sherman Butler (WIPP)

Peter Feng (NNSA-AC)

Brian Fiscus (NNSA-NV)

John Kubicek (NTS)

Kevin Levy (DOE-CH)

James Niehoff (FERMI)

James Priest (FERMI)

John Saidi (DOE-CA)

DOE Sub-Surface Working Group Activities

SWG Objective Statement

To assist in the development of a consistent set fire protection criteria in National consensus standards or, where necessary, to augment such criteria for DOE Sub-Surface facilities.

DOE Sub-Surface Working Group Activities

National Consensus Standards - Definitions

- NFPA 520, *Standard on Subterranean Spaces*
  - Subterranean Space. A cavern resulting from the extraction of subsurface-located material from underground areas in a manner that the surface area of the property is not disturbed except in the vicinity of the entrances and ventilation openings
  - *Developed Space*. An area of the subterranean space that has been altered for the use of advanced industrial capability, technological sophistication, or economic productivity.
  - *Common Space.* The area of the developed subterranean space other than buildings, including but not limited to roadways, railways, loading docks and entrances.
  - *Undeveloped Space*. Subterranean space that has been mined but has not been altered for the use of advanced industrial capability, technological sophistication, or economic productivity.

DOE Sub-Surface Working Group Activities

National Consensus Standards - Definitions

- **NFPA 101, Life Safety Code**
  - *Underground Structure.* A structure or portions of a structure in which the floor level is below the level of exit discharge.
  - Not to be confused with a basement which is defined as “any story of a building wholly or partly below grade plane that is not considered the first story above grade plane”
  - Requirements for underground spaces are located in section 42.7.4 of NFPA 101
- **International Building Code**
  - U*nderground Buildings* (Section 405). The provisions of this section apply to building spaces having a floor level used for human occupancy more than 30 feet (9144 mm) below the lowest level of exit discharge.

DOE Sub-Surface Working Group Activities

SWG - Definition

- Sub-Surface Facility: A space (including tunnels, or networks of drifts) resulting from the extraction of material below grade where the footprint of the excavated space extends beyond the footprint of any connected above grade structures. Such a facility may include the following components:
  - *Developed Space*: Areas that have been altered for the performance of mission-oriented process operations or experiments. This space includes the underground infrastructure, such as escapeways, refuge stations, ordinary-hazard supporting-activity areas, and inactive, legacy process operation/experiment areas.
  - *Undeveloped Space*: Areas that are either currently being mined or have already been mined, including the installation of Sub-Surface support features, but has not been altered for the performance of mission-oriented process operations or experiments. Undeveloped space may also include non DOE mined spaces bordering DOE subsurface facilities.
  - *Process Operation/Experiment Space*: Areas in which high-hazard material is staged or used that is separated from other areas by fire-resistive construction.

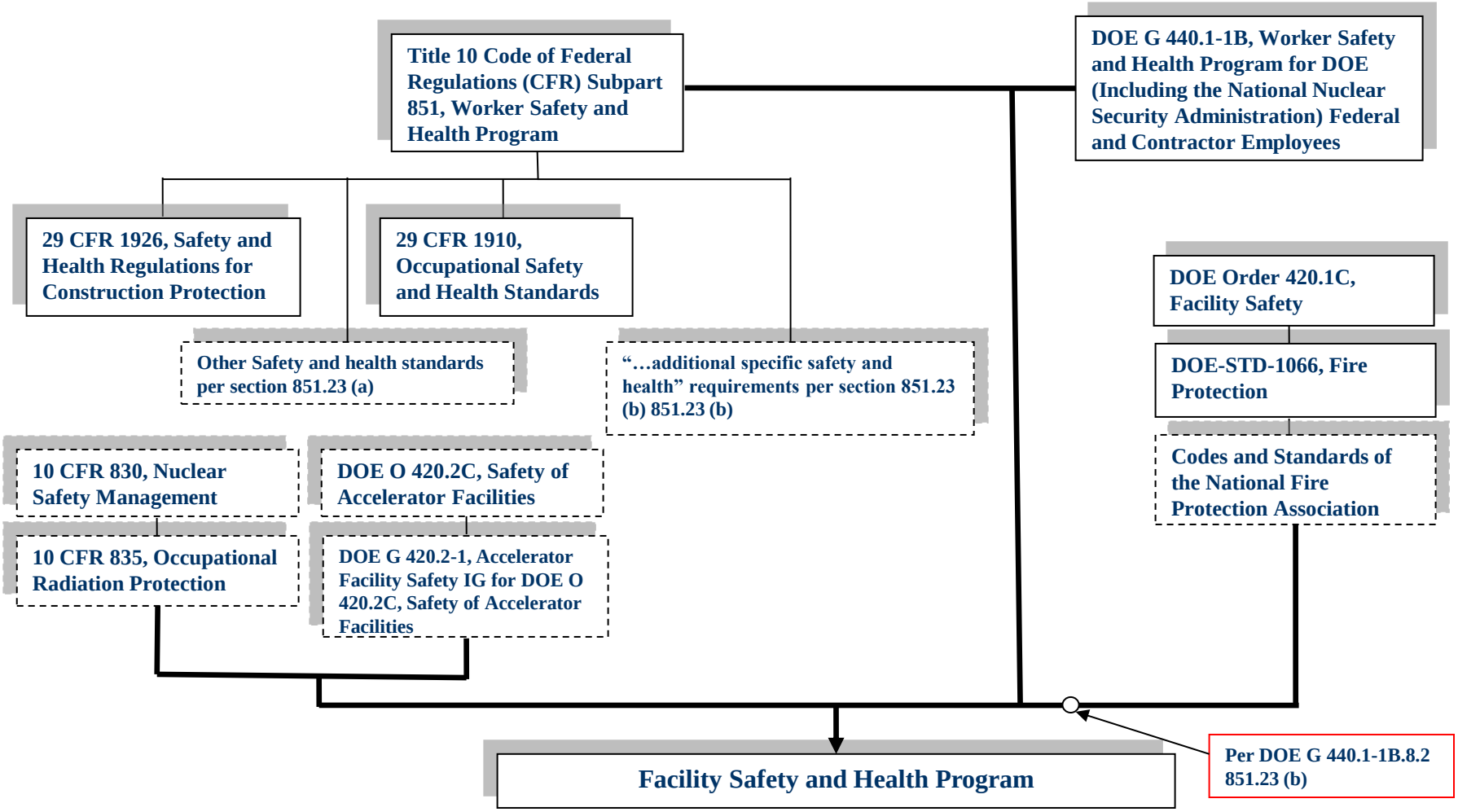
DOE Sub-Surface Working Group Activities

SWG Activities

- Solicited and received representation on the NFPA 520 Technical Committee:
  - Jim Priest (FERMI) - Principal
  - John Kubicek (NTS) – Alternate
- Identify existing DOE Sub-Surface Facilities
  - 19 active and 14 inactive facilities
- Identify DOE regulations associated with Sub-Surface Facilities
  - 10 CFR 851, Worker Safety and Health Program
  - 10 CFR 830, Nuclear Safety Management
  - 10 CFR 835, Occupational Radiation Protection
  - DOE Order 420.1C, Facility Safety
  - DOE O 420.2C, Safety of Accelerator Facilities
  - DOE-STD-1066-2012, Fire Protection

DOE Sub-Surface Working Group Activities

Facility Safety Regulation Flow Down



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DOE Sub-Surface Facilities

- Two facility types:
  - Storage – Mainly long-term radiological waste storage sites
  - Laboratory -physics research (particle detectors and accelerators) or weapon component testing activities
- Regarding Sub-Surface Storage
  - Waste Isolation Pilot Plant – A shaft accessed facility

    References the Mine Safety and Health Administration (MSHA) through Public Law 102-597, The Waste Isolation Pilot Plant Land Withdrawal Act.
  - Yucca Mountain – A tunnel accessed facility

    MSHA became incorporated under DOE/RW-0586, *Subsurface Safety and Health Requirements Document*

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MSHA

- Primary Statutory Driver ?
  - 30-CFR-57, *Safety and Health Standards – Underground Metal and Non metal Mines*
  - Just like OSHA, MSHA laws are under the authority of the Department of Labor and might not apply to the DOE.
  - For this reason, the DOE references compliance to OSHA within its own law 10 CFR 851.
- SWG Draft Report
  - Presented a discussion on the similarities and differences between OSHA and MSHA safety attributes and concluded two recommendations to the DOE Office of Primary Interest (OPI)

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SWG – Recommendation 1

- **The DOE should incorporate key provisions of 30 CFR 57 into DOE's Worker Health and Safety Rule addressing DOE Sub-Surface facilities such as:**
  - Employee training and equipment;
  - Background radiation (Radon) levels;
  - Air quality and redundancy;
  - Illumination minimums based on the Sub-Surface facility components;
  - Occupant sound levels based on the Sub-Surface facility components; and
  - Other Sub-Surface protection features that are not addressed by OSHA

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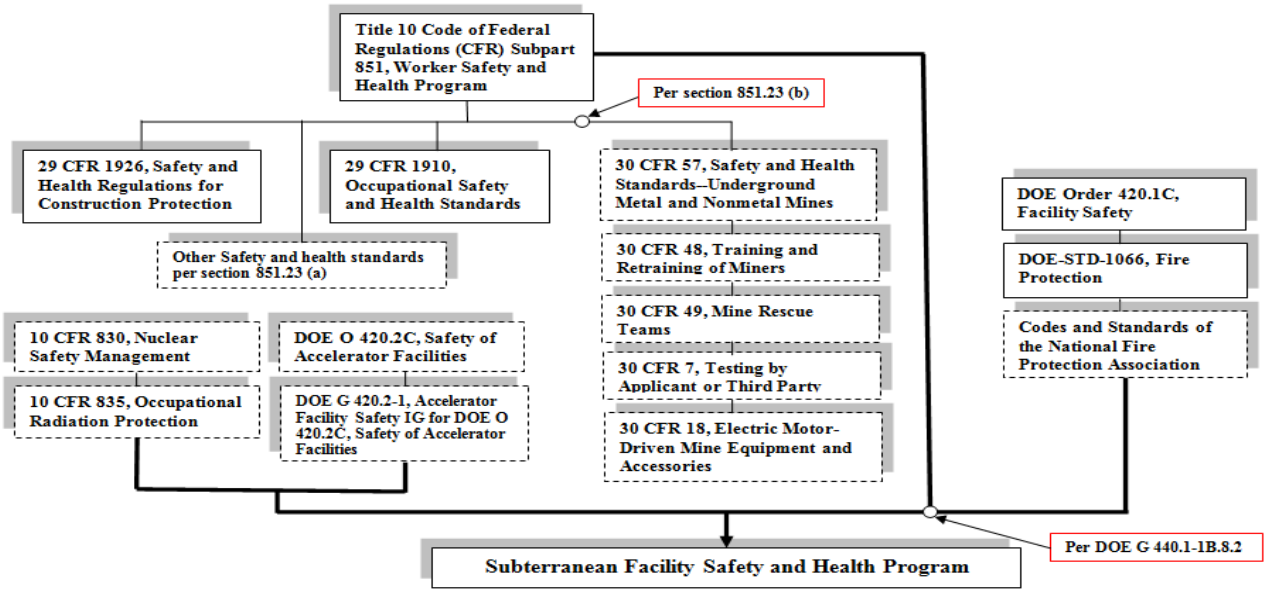
Facility Safety Regulation Flow Down with SWG Recommendation 1



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DOE Sub-Surface Working Group Activities

SWG – Recommendation 2

- **The DOE should establish guidelines for coordinating DOE O 420.1C design requirements into DOE Sub-Surface facilities.**

SWG – Recommendation 3

- **The DOE should establish guidelines for Mine Rescue or Emergency Responder teams.**

Both recommendations focus on incorporating such guidance into DOE-STD-1066, DOE's fire protection technical standard.

Questions/Comments?

If you would like to see a copy of the draft report please send me an e-mail request:

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