# AFRL's New Tool for HAZCOM Compliance at R&D Level: CHAMP (Chemical Hazard Analysis & Management Program)

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**Abstract:**

This presentation is an overview of AFRL’s new tool for HAZCOM compliance at the Research & Development level. The tool is called CHAMP (Chemical Hazard Analysis & Management Program).

**Subject Terms:**

16. **Security Classification of:**

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AFRL’s New Tool for HAZCOM Compliance at R&D Level:

CHAMP

Chemical Hazard Analysis & Management Program

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Geographic Attractions & Hazards

California State Parks

MAGNITUDES
- 4.6 to 4.9
- 5.0 to 5.4
- 5.5 to 5.9
- 6.0 to 6.4
- 6.5 to 6.9
- 7.0 to 7.4
- 7.5 to 7.9
- 8.0 and greater
Chemicals Hazards
Modern Standards

∞ Hazard Communication Standard (HAZCOM) 29 CFR 1910.1200 (h) (1) states that Employers provide their employees (at initial assignments and continuously)

∞ Training & Information

∞ Hazardous chemicals
∞ New physical or health hazard
∞ Hazard Categories

∞ flammability, carcinogenicity etc.

∞ READILY AVAILABLE chemical-specific information through hazard labels and (M)SDS

∞ New (GHS) Hazcom waiting at OMB
∞ Adopted to UN Standards – revision after ~25 years
**Chemical Hazard Analysis**

- Reactivity is an intrinsic property of a material
  - Understand the nature of the material
    - Training is very important
    - Use control measures

- Mitigating Flammability and Health Hazards
  - Engineering controls
  - Proper PPE
  - Removing ignition sources
  - Less important than Reactivity for Hazard classification?
Current Chemical Procurement Process

Inventory

Ordering POC

Safety Training

Users

Pharmacy

Certifier

Safety/EM/BEE

System Safety

Weapon Safety

Biocountermeasures

Environmental Management

Establishment Safety

Terrorism Countermeasures
Need for a NEW SYSTEM

- **Researchers**
  - *Ordering & chemical procurement*
    - Current system too complicated – causes mission delays
- **Safety Office**
  - *Efficient processing of chemical licensing based on Hazard Rating Workflow*
- **Hazcom Program**
  - *Track the life-cycle of hazmat from conception to grave*
    - Ensure compliance with OSHA/EPA regulations
    - Avoid stockpiling of hazmat due to oversight/ multiple lab-wide inventory databases
- **First Responders/Fire Department**
  - *Emergency/disaster preparedness, quick information access on mobile devices*
- **Security Office**
  - *Tracking of explosives, munitions and chemicals of interest on the DHS and DEA lists*
- **Site Employees**
  - *Right to Know (disclose hazards i.e., chemical, EM/X-ray radiation, laser etc.)*
Enterprise Business Model

∞ DoD
   ∞ NAVY - North Point CA
   ∞ Uses a single (Master) database managed by a contractor

∞ Industry
   ∞ Pharmaceuticals – BMS (New Jersey)
   ∞ Tightest safety standards
   ∞ Risk of losing business
   ∞ Total accountability of ALL hazmat

∞ Academia
   ∞ USC, Los Angeles – CAPS
   ∞ Single database use with hazard information
Proposed Solution

(CHAMP PROMO)
Ideal CHAMP Lifecycle

Request
Approve
Procure
Dispense
Consume
Dispose
Measure of Chemical Hazards

- Use MSDS to determine the values associated with
  - Reactivity, Health, Flammability and Special properties
  - See if SPECIAL Property (Ox, Water Reactive) exists
  - Rate in the order
    - Reactivity > Health > Flammability

HAZARD RATING (HazRat) Proposal (single digit)

- Special weights (Can be customized based on Engineering Controls)?
  - Special – ALWAYS a review and elevates risk to MAXIMUM
  - \[ R = 0.65, H = 0.25, F = 0.10 \text{ or } R = 0.34, H = 0.33, F = 0.33 \]
  - \[ \text{HR (HazRat)} = R \times 0.65 + H \times 0.25 + F \times 0.10 \text{ (HMIS)} \]
  - \[ \text{HR (HazRat)} = R \times 0.34 + H \times 0.33 + F \times 0.33 \text{ (NFPA)} \]
  - Can be tuned based on engineering controls, trainings, PPE
Hazard Rating (HazRat) Based Workflow

- Make it convenient for researcher or the research facility to obtain a blanket license based on the HR number

- HR >= 2 all in the **RED ZONE**
  - Mandatory review by Safety office

- HR >= 1 BUT < 2 will be in the **YELLOW ZONE**
  - Discretionary review

- HR < 1 will be in the **GREEN ZONE**
  - Safe(r) stock chemicals/solvents
  - May qualify for blanket permit
Proposed Process Streamlining

*Project-personal training validation
The New Web Based CHAMP System is:

- USAF Compliant platform (.NET/SQL2008)
- Interoperable with current DoD/NIH/NLM systems
- IT standard/compliant web technology
- Request using web forms
- Web-service capabilities ensuring data integrity
- Ensuring form completion before submittal
- Intelligent workflow based on “Hazard Rating”
- Integration into SharePoint/Outlook workflow
Stringent DoD network requirements – could be more flexible in academia
Login Information Capture

Use of technology to validate user training, authorization to use specialized chemicals etc.

ASP.NET Framework for smooth integration with current Windows applications

Capture User Info
- Name
- Contact Info
- Location
- Project No
- Task No
- Trainings
- Supervisor
- Work Location
- Roles

Login required for each employee to check inventory, order chemicals – Meets USAF IT compliance requirements
HazRat/HazInfo in Action

PyroTec

Chemical Hazard Analysis & Management Program - CHAMP

Sortable Fields

Quick sort of “bad actors” based on HazRat

PPE requirements

Emergency Contact Information
Source support for Emergency Responders

PyroTec

Chemical Hazard Analysis & Management Program - CHAMP

Welcome: Mouse

Home Search Request Approval Authorization Emergency Maintenance

NiOSH Pocket Guide To Chemical Hazards

INDEX of Chemical Names, Synonyms and Trade Names

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

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DOT Emergency Response Guidebook

CHAMP 2 Min Promo

Welcome: Mouse
Centralization & System Integration

PERSONNEL
IT Support
User ID CAC login
Employee & Supervisors
Security & Trainings

CHEMICAL INFORMATION
Research Chemical USER Data to be provided – needs to meet QA Standards otherwise GI-GO

FACILITY MANAGEMENT
Facilities information
Engineering Controls, Glove boxes, Showers, eye washes

SAFETY INFO
Permit Information
Active licenses
DATA from ESOH database (current licenses etc)
Application Benefits

- Prevent Inadvertent Chemical Exposure
- Prevent Personal INJURY due to inadequate risk evaluation
- Prevent injury to First Responders (Fire/Medics)
- Reduce disposal cost from stockpiling
- Increase productivity, boost morale
- Allow R&D to stay mission focused
- Process leaning will help save over 0.5M over next 5 years
Acknowledgments

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Deputy RZS

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Chief of Safety

Dr. Pertti Hakkinen
NIH/NLM

Mr. Tuong Chu,
System Safety Engineer

Air Force Research Laboratory, Edwards
Backup
Why a new system

Cross-functional Setup

R&D
FIRE
CE
Systems
Ground
Weapons
BIO
Environmental

CHAMP

R&D
CE
FIRE
BIO
Weapons
Ground
Systems
ENVI MGMT
Wiser-CHAMP integration

- Provide web-services for hazards
- Assist in predicting protective distances using DoD Google Earth maps
- Provide customized and quality data to AF first responders (3 sources)
- Help evaluate hazards of newly developed materials in R&D
- Address chemical compatibilities
- Many other benefits not determined yet
Side by side comparison of process
Same chemical may pose different hazards based on location/personnel

R&D Lab
- Handled by SMEs
- Fume hoods
- PPE
- Engineering controls

Hazmat Stockroom
- Handled by hazcom trained employees
- May or may not have fume hoods
- PPE

Receiving Office
- NO Fume hoods
- PPE use?
- Handled by logistics employees

Transportation* – spills & leaks

Each phase should have its unique risk mitigation strategy

* DOT compliance for transportation