ISM Day 2010

March 12, 2010

J. Murray Gibson
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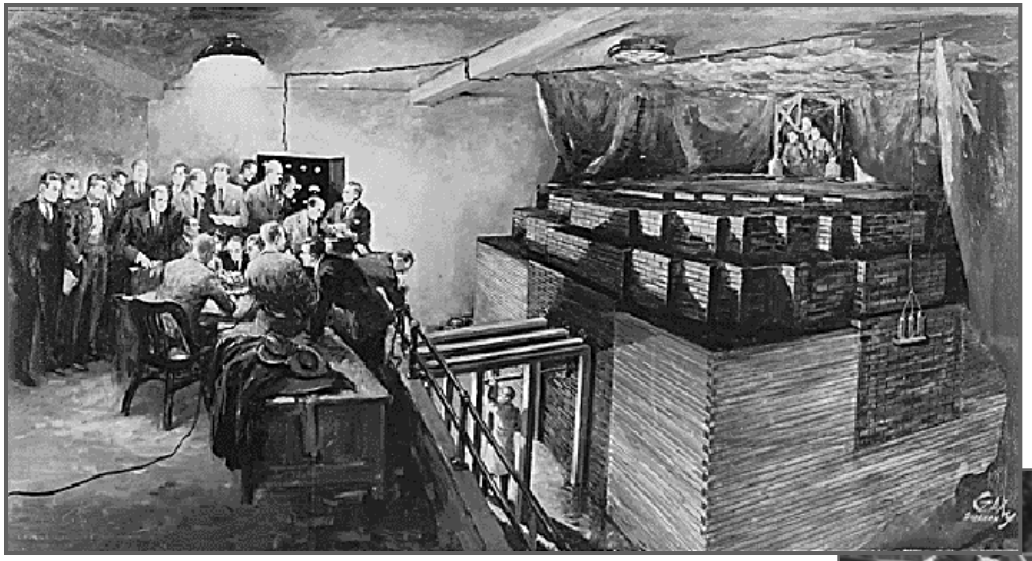
Photon Sciences

Argonne – History of Science and Innovation

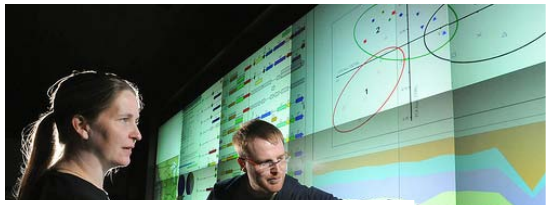


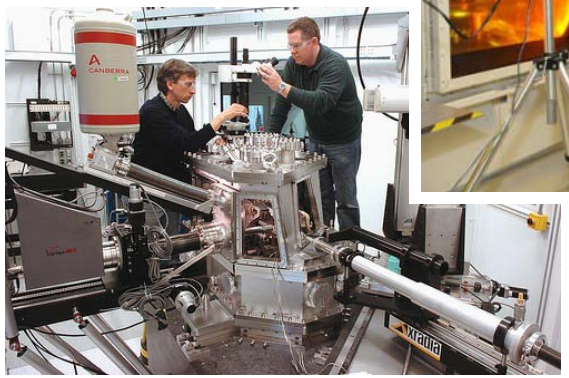
From Fermi's team producing the first sustained nuclear chain reaction under the football stands in a squash court on the University of Chicago campus…

…to Argonne's research on advanced transportation technologies, Argonne has been on the cutting edge of science and technology.

Supporting Argonne's Mission

All work at Argonne supports the mission.



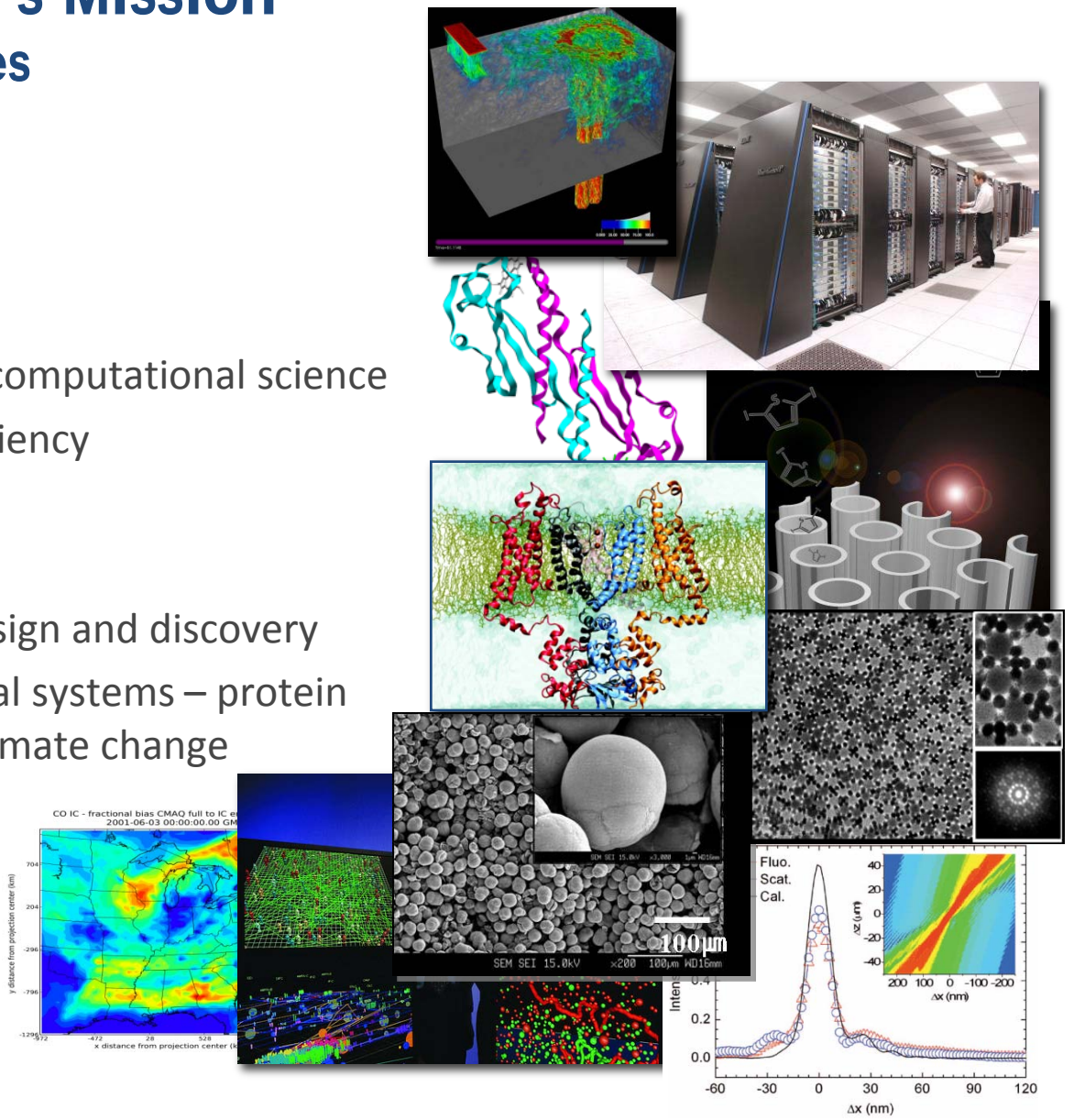


The work that supports Argonne's mission is critical to continuous success.

Science is Argonne's Mission
Our Strategic Initiatives

Major Initiatives:

- Hard X-ray sciences
- Energy storage
- Leadership computing and computational science
- Alternative energy and efficiency
- Nuclear energy
- National security
- Materials and molecular design and discovery
- Biological and environmental systems – protein discovery, closing gaps in climate change understanding

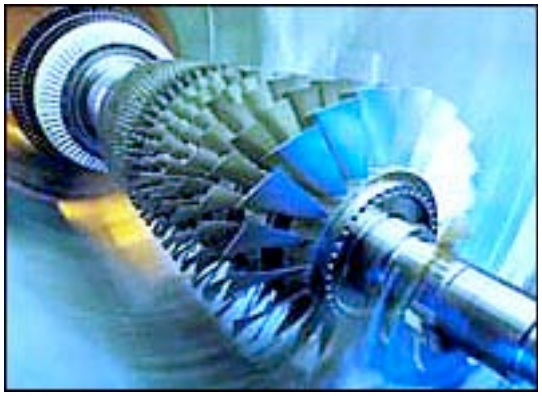


APS is key to the future of Argonne

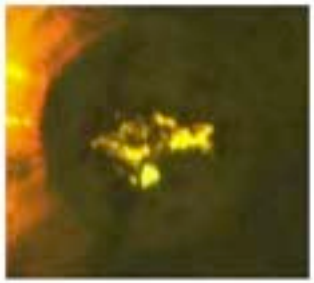
- APS is the largest user facility in the US
- The APS Upgrade is the number one priority at the laboratory
- APS science will address the key energy and national security missions of the laboratory

APS/CNM Nanoprobe wins R&D100 Award

2009 Nobel Prize in Chemistry based in part on APS work



New stable coatings developed allowing Si nitride and carbide alloys for use in more efficient gas turbines



Simple metal (Na) becomes transparent under pressure

Work and Risk

- **Science demands intellectual risk**

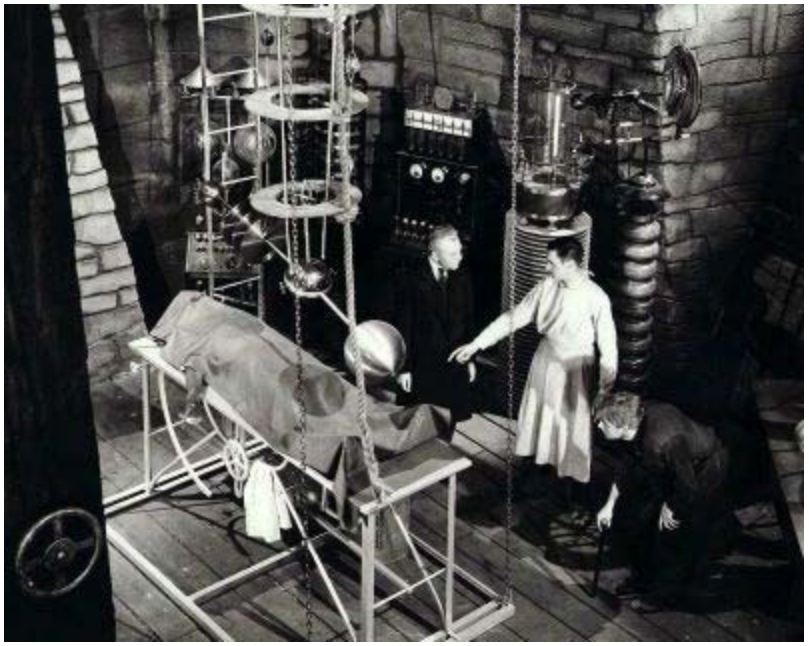
- When the level of intellectual risk taking is applied to behavior and actions, the risks are **real** and need to be mitigated
  - We can tolerate risk only if we understand what it is and are able to control the hazards
  - We control hazards to mitigate risks

- Eric Isaacs describes intellectual risk as it relates to ISM and WPC

- We use Integrated Safety Management (ISM) and Work Planning and Control (WPC) to mitigate risk

“Pushing the envelope”

- When you have a brilliant new idea it can be hard to realize that you are moving outside the “hazard” envelope that you previously defined
- The “moment of truth” is recognizing when new unfamiliar hazards have been introduced
- We don’t catch this very effectively with an event-driven system
  - periodic review, purchasing
- It is up to us



“Igor later realized that he should have exercised his stop work authority”

“Watch your buddy”

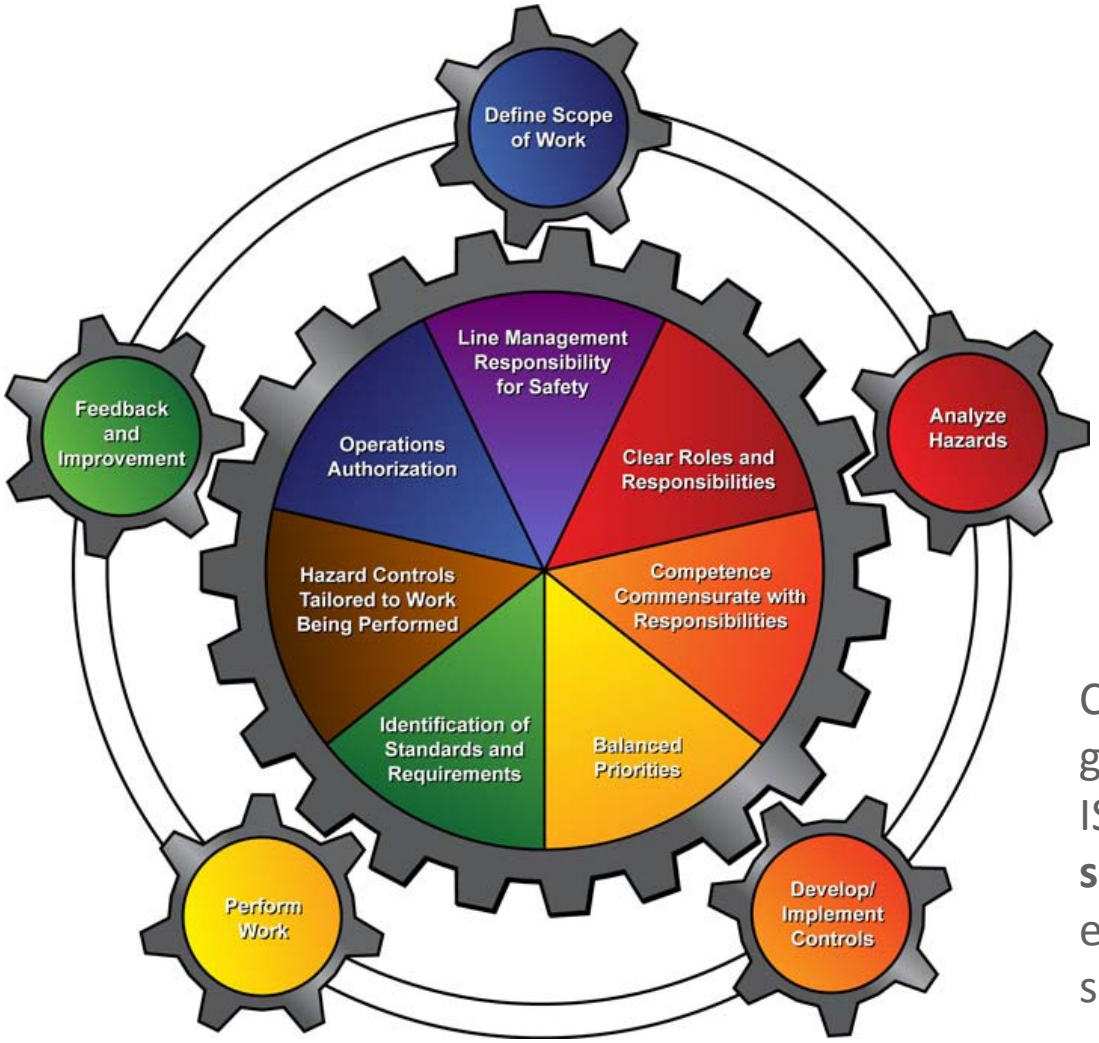
- Other people’s eyes are your greatest strength

“Do It Safely, Do It Right”

Why Apply Integrated Safety Management?

- Argonne’s work must be done well and safely
- Integrated Safety Management is our process to ensure safe, quality work
- ISM is:
  - a process that enables Argonne to perform cutting edge research, while protecting our irreplaceable intellectual capital – our employees, as well as the public and the environment (DOE Policy 450.4)
  - working safely is a natural part of the job, not just something the “safety people” do
  - founded on seven principles and five core functions

Applying Five Core Functions and Seven Guiding Principles to the Work in Photon Sciences



Core functions and guiding principles of ISM detail a **common sense process** to establish and ensure safety in the workplace.

Discussions at the group level on Friday

- Please discuss how your group implements ISM
- Discuss how the various processes (e.g. work planning and control) support your ability to carry out work under ISM
- It would be most helpful if you would identify the areas that give you the most concern, and how ANL and divisional management could help provide you with the best tools and resources to do your job safely and efficiently
  - If possible, identify goals to measure improvements we'd like to achieve
- This can form the basis of divisional improvement plans that we will have to develop in the next month or so

We need to listen to you

Work Planning and Control is ISM

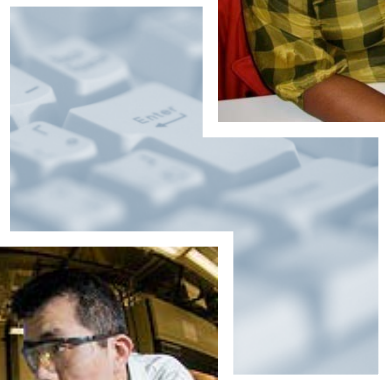
Considering safety and work simultaneously improves the process and the product.

- Work should be planned and hazards controlled using the five core functions of ISM:
  1. Define scope of work
  2. Analyze hazards
  3. Develop/implement hazard controls
  4. Perform work within controls
  5. Feedback and improvement

- It means asking the questions associated with each of the core functions during the planning and implementation of all work:
  1. What will the work/job/experiment involve?
  2. What are the hazards of this job?
  3. What can be done to mitigate the hazards?
  4. Were all of the hazard mitigations followed?
  5. Was there anything that could have been changed to improve the quality and safety of the work?

Work Planning and Control
Experimental and Non-Experimental

One of the ways we mitigate hazards is by using Work Planning and Control



- **In transition**
  - The current process may be burdensome and complex
  - Online system in development to streamline the process – will be useful and helpful when finalized
  - It will provide a uniform and required way of doing Work Planning and Control
  - As the foremost user facility in the nation, we will work together to find the best ways to improve the process and implement Work Planning and Control

Work Planning and Control in Your Division
Some Ideas for Group Discussion Friday Morning

- Work planning and control for non-experimental work at APS has been strong
  - but we had not done a formalized hazard analysis on new procedures
  - and we need to ensure there is a room for continuous improvement

- The Experimental Work Planning and Control through ESAFs has been strong
  - but what about experiments outside a beamline?
  - what about beamline maintenance?

- ISM is designed to protect you and protect others
  - have we done all we can to protect inexperienced users, visitors and students?
    - or partially-experienced postdocs?

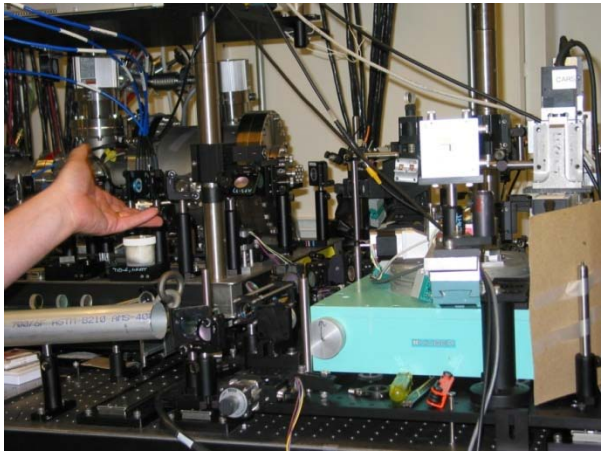
Examples of incidents at APS due to inadequate work planning and control

Grad student attempts to remove live plug with pliers 9/2007

"near hits"

Pneumatic crimping tool catches employee's fingertip 9/2008

Laser strike suspected during alignment 9/2008



When things go wrong
Incidents and accidents

- **Recurring problems (incidents)**

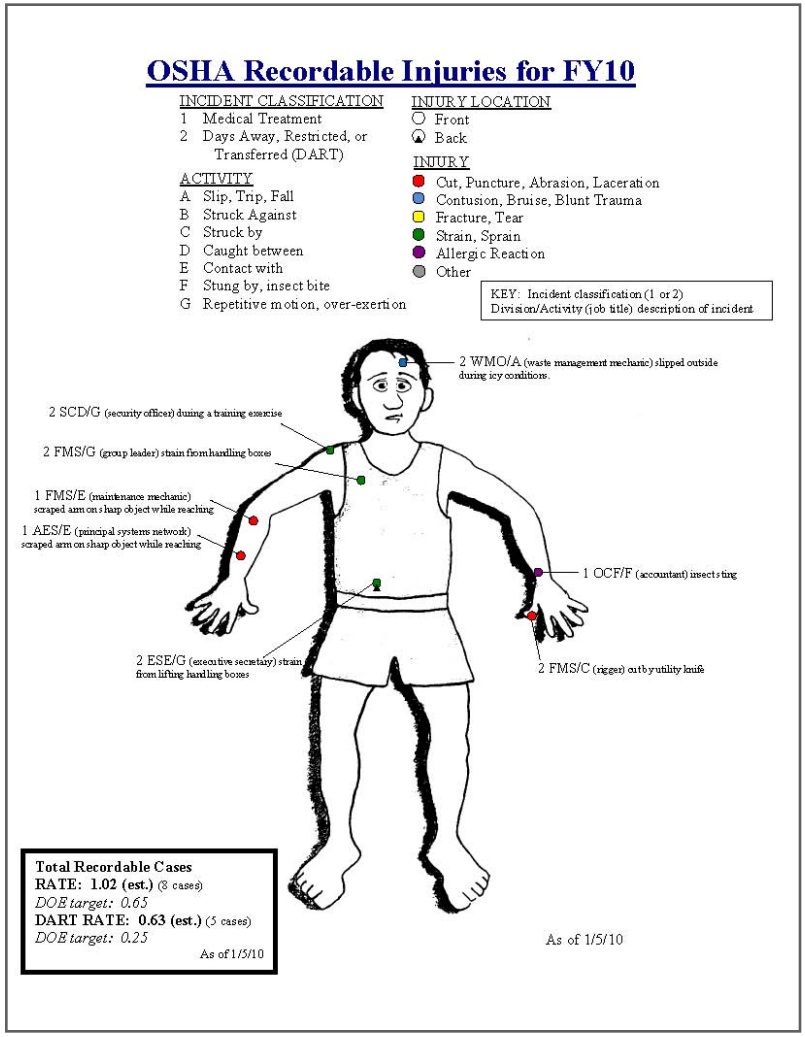
  Since November 2009 ANL has had more than seven significant incidents

  Common themes:
  - Too familiar or unfamiliar with the work
  - Complacency, over-confidence
  - New work, new hazards, new challenges
  - Time constraints

- **Lack of attention (accidents – Safety Guy)**

  Falls, strains, cuts, stings, fractures

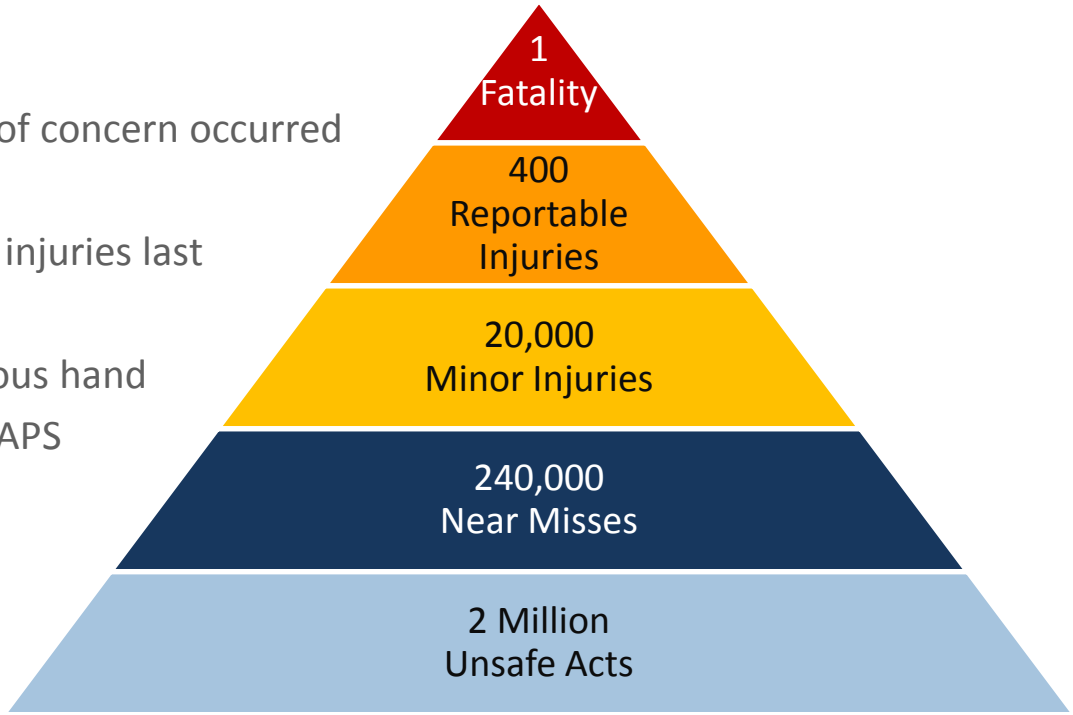
  Statistics are important and tell a story



Evaluating Argonne's Recent Incidents

- According to statistics, one in two million unsafe acts results in a fatality
  - Every fatality starts with an unsafe act
  - For every 2 million unsafe acts, there are 240,000 near misses, 20,000 minor injuries, 400 reportable serious injuries leading up to a death

- How does this relate to APS?
  - None of the recent incidents of concern occurred at APS
  - But APS personnel suffered 8 injuries last year; 5 reportable, 3 minor
  - Within past 18 months 3 serious hand injuries occurred at APS (last APS safety notice)
  - APS cannot be complacent



Conclusion

- Argonne remains on the cutting edge of science and technology
- Delivering innovative research and technology is our mission
- All work at Argonne supports the mission
- All work must be done well and safely
- Integrated Safety Management is our process to ensure safe, quality work
- Work Planning and Control is ISM
  - Work should be planned and hazards controlled using the five core functions of ISM
  - Considering safety and work simultaneously improves the process and the product
  - Uniform and required way of doing WPC is underway (web system)
  - We control hazards to reduce risks

Additional APS Activities
ISM Day 2010

- Rod Gerig will speak next on non-experimental WP&C and its use at APS
- George Srajer will speak on experimental WP&C and its use within XSD
- On Friday, March 12, office and work area cleanup all day
- On Friday morning group/CAT leaders will hold discussions with their personnel
  - Discuss and provide input for discussion slides from this talk
  - Discuss and provide input for suggested safety improvements for their divisions
- On Friday afternoon each division will meet separately with their division director or designee in the Building 402 auditorium for dialog between DD and personnel
  - 1:00 – 2:00 PM ASD
  - 2:00 – 3:00 PM AES
  - 3:00 – 4:00 PM XSD + CATS

Questions or Comments?

- ISM Guiding Principle #1

  “Line management responsibility for safety”

- Discussion Question

What can I do to help you do your work safely?