



**Federal Energy Regulatory Commission  
Division of Dam Safety and Inspections**



**National Hydropower Association  
Hydraulic Power Committee  
May 13, 2009 Meeting  
Washington, DC**

**FERC DAM SAFETY PROGRAM**



# **FERC Presenters**

**Daniel J. Mahoney, Director**

**William H. Allerton, Deputy Director**

**David Capka, Supervisor-Dam Safety Engineering**

**Frank Calcagno, Senior Geologist**



## **FERC UPDATE**

- **Security**
- **Workshops and Training**
- **Tainter Gate Initiative – Second Round**
- **State Dam Safety Coordination**
- **Initiatives**



# Federal Energy Regulatory Commission Division of Dam Safety and Inspections



## FERC Security Program

DHS has inspected some dams within the past few months. How are FERC & DHS working together for security of hydro facilities?



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- Are considering involving the DHS PSA's in FERC security inspections.**



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- **As an example: Revision 2 utilizes "base" threat scenarios developed by classified R&D; v2 of DAMSVR uses threshold Consequence values in-line with the DHS Consequence Top Screen (Tier 1 and 2) data call.**



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(April 22 – May 22 period)**



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- *Recognizing the sensitive nature of public notice, however, we are careful who can see the review products:*
- *Security Program is posted on website.  
(April 22 – May 22 period)*
- **DAMSVR sent out for a controlled review.  
(May 1 – June 1 period)**



# **Workshops and Training**

## **Case Studies Workshop**

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- Additional training is needed to improve the knowledge of the engineering profession on how to evaluate dam safety problems.**



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- We can improve both owners and regulators dam safety programs by learning from past case studies*
- The guidelines don't always have to be satisfied to reach a consensus on how to improve the factors of safety at a dam.*
- Additional training is needed to improve the knowledge of the engineering profession on how to evaluate dam safety problems.*
- We all need to work together to improve our respective dam safety programs**





# Federal Energy Regulatory Commission Division of Dam Safety and Inspections



## Workshops and Training

Have there been any lessons learned from the 2008 big earthquake in China regarding EAPs and other dam safety related programs?



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- **Quick action to design and build a spillway in 2 days at a huge earthquake induced landslide allowed a controlled release of the landslide reservoir.**



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- **Many appurtenant features (powerhouse, office, gate house, equipment house, etc.) appeared to be designed to much lower standards because those structures experienced much worse damage than the dams themselves.**



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- Many appurtenant features (powerhouse, office, gate house, equipment house, etc.) appeared to be designed to much lower standards because those structures experienced much worse damage than the dams themselves.*
- The damage due to rockfalls in the areas was substantial. Rockfalls also caused a lot of damage to one spillway gate so that the project overtopped.**



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- **The concrete faced rockfill dam face was damaged above the waterline. There is some thought that if water had been on the face it would not have failed.**



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*Have there been any lessons learned from the 2008 big earthquake in China regarding EAPs and other dam safety related programs?*

- The concrete faced rockfill dam face was damaged above the waterline. There is some thought that if water had been on the face it would not have failed.*
- The issue at this (CFRD) dam was more related to failure of gate controls. The outlet works were rendered inoperative due to damage to the control room and in some cases structural damage to the operating mechanisms.**



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- The concrete faced rockfill dam face was damaged above the waterline. There is some thought that if water had been on the face it would not have failed.*
- The issue at this (CFRD) dam was more related to failure of gate controls. The outlet works were rendered inoperative due to damage to the control room and in some cases structural damage to the operating mechanisms.*
- As far as EAP's, the lake itself became the only way to get emergency crews in and out, as roads were blocked by landslides and bridges were out. So, a judgment call had to be made regarding the lowering of the reservoir behind the dam versus providing sufficient water levels to allow boat and barge access.**



## **Workshops and Training**

**Are there any other FERC workshops Planned?**

- **EAP Workshop – July 8<sup>th</sup> and 9<sup>th</sup> – Denver, Colorado**
- **Security Workshop – Time/Place to be Determined**





## **Workshops and Training**

**We understand there was a joint workshop in 2008 among the FERC, USACE, and USBR on Risk Assessment for Dams.**

- You are referring to the Tolerable Risk Workshop held in Washington, DC. We are participating along with the Bureau of Reclamation in the Corps of Engineers' development of their risk program so that we remain informed on what the Corps and the Bureau are doing with respect to risk analysis.**



## **Tainter Gate Initiative – Second Round**

**Has FERC seen any particular information or Patterns of findings coming out of the second round of tainter gate inspections that licensees would benefit from knowing?**

**How useful have the hoist motor current measurements turned out to be in detecting problems with tainter gates?**

- The motor current measurements have been responsible for quite a few “catches” since the initiative was rolled out in 1998. undersized motors have been installed as a replacement for failed original equipment. Overloading has been caught. The motor current measurements have clearly been worthwhile.**



## **State Dam Safety Coordination**

**Is FERC Working With Many State Dam Safety Agencies?**



## **State Dam Safety Coordination**

- **FERC Has Been Working With the State Dam Safety Programs for Many Years**
- **States are Invited on Every FERC Dam Safety Inspection**
- **Most States Do Not Attend – Very Busy With Their Own Dams**
- **Several States Have State Laws Asserting Jurisdiction on FERC Dams**
- **Implementation Varies Across the United States**



## **State Dam Safety Coordination**

- **Federal Power Act and State Laws**
- **The More Eyes on a Dam, The Better**
- **Our Policy is to Maintain a Close, Supportive and Productive Relationship With the State Dam Safety Offices**
- **Our Goal is to Minimize Having to Answer to 2 Regulators**



## **Ongoing Initiatives and Projects**

- **Potential Failure Mode Analyses (PFMA)**
- **Dam Safety Surveillance and Monitoring Plans**
- **Pumped Storage Technical Guidance Task Group**
- **Regional Technical and Management Workshops**
- **Owners Dam Safety Programs**

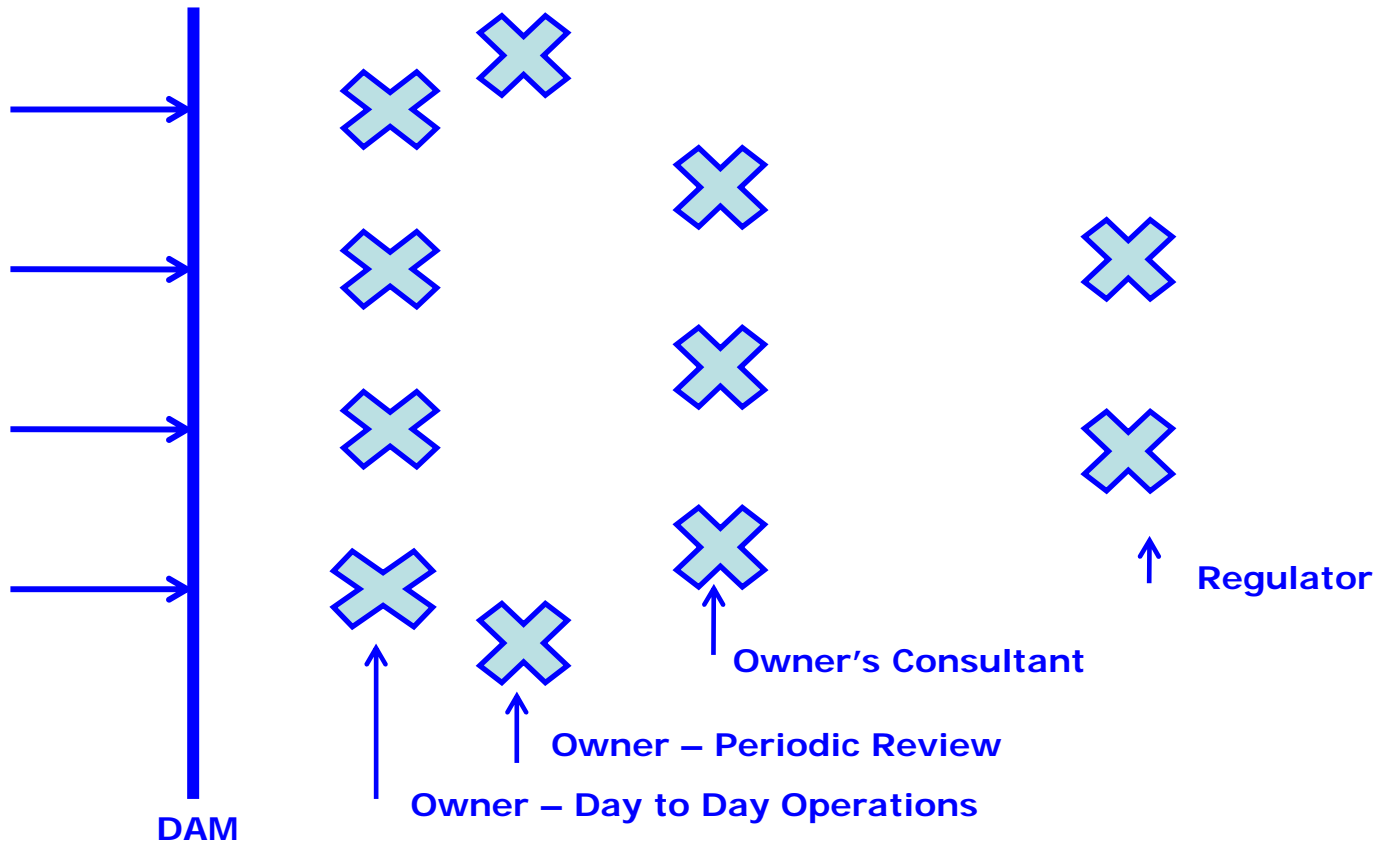


## **Owners Dam Safety Programs (ODSP)**

- **ODSP significant factor in major dam failures**
- **Problems ranged from communication failures to negligence**
- **Taum Sauk is a wake up call for dam safety community**
- **Peer review found some owners deferring responsibility**
- **FERC Dam Safety Program may be encouraging this deference**



## Football and Dam Safety







# **Owners Dam Safety Programs (ODSP) What is a Good Dam Safety Program?**

- **Understand Responsibility**
- **Good Communication**
- **Clear Designation of Responsibility**
- **Sufficient Allocation of Resources**
- **Learning Organization**



# **Owners Dam Safety Programs (ODSP) What is a Good Dam Safety Program?**

- **One Size Does Not Fit All**
- **Program Meets Needs of Inventory**
- **For Guidance on What FERC Believes Constitutes a Good Dam Safety Program See the Taum Sauk Stipulation and Consent Agreement on the FERC-D2SI Website at:**

<http://www.ferc.gov/industries/hydropower/safety/projects/taum-sauk.asp>



## **Owners Dam Safety Programs (ODSP)**

- **Discussing Importance of ODSP With Owners**
- **Met With Owners With Good/Not So Good Programs**
- **Internal FERC Assessment**
- **Specific Focus of Last Year's Annual Inspections**
- **Owners Self Assessment Evaluation Parameters**



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## New Initiatives

Ensuring the Effectiveness of EAPs – Time Sensitive EAPs



## **New Initiatives**

### **Ensuring the Effectiveness of EAPs – Time Sensitive EAPs**

- **Time of Flood Wave Arrival Compared to Time for Local EMA to Notify and Evacuate if Necessary**



## **New Initiatives**

### **Ensuring the Effectiveness of EAPs – Time Sensitive EAPs**

- **Focus on Development Immediately Below the Dam**
- **Does the EAP Provide for the Timely Notification or Evacuation if Necessary**



## **New Initiatives**

### **Ensuring the Effectiveness of EAPs – Time Sensitive EAPs**

#### **Time Required for Activating EAP**

- **Varies for specific dams and PFM**
- **Detection**
- **Verification (Onsite or have to travel to dam?)**
- **Contacting Local EMAs**



## **New Initiatives**

### **Ensuring the Effectiveness of EAPs – Time Sensitive EAPs**

#### **Time for Local EMAs to Contact Homeowners**

- Travel to Neighborhood?**
- Telephone Alert?**
- Time for evacuation?**





## **New Initiatives**

**Ensuring the Effectiveness of EAPs – Time Sensitive EAPs**

- Flood Wave Arrival Time?**



## **New Initiatives**

### **Ensuring the Effectiveness of EAPs – Time Sensitive EAPs**

- Are Special Alert Measures Required?**
- If so, Dam Owner Works with Local EMA to Establish Necessary Alert Measures**



## **New Initiatives**

### **Ensuring the Effectiveness of EAPs – Time Sensitive EAPs**

- **Procedure to Assess Time Sensitive EAPs**
- **Dam Owners should check their EAPs**



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**Questions?**