Meeting of the Central Valley Flood Protection Board
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Staff Report – Joint Presentation on Levee Inspections

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1.0 – ITEM

Discussion of the levee inspection criteria of the Department of Water Resources and the U.S. Army Corps of Engineers, briefing regarding the results of the Corps' Periodic Inspections completed to date and their implications, and State and local agencies plan of actions for addressing the deficiencies identified by the Corps.

2.0 – BACKGROUND

Regular Inspections of California's flood protection systems are necessary to ensure these systems can perform as designed in the event of a flood. The inspection of levees, pump stations, weirs, and other facilities are performed by the following organizations at the listed intervals:

- Local Maintaining Agencies, 2x's /year (Winter, Summer)
- State of California Dept of Water Resources Inspectors, 2x's/ year (Spring, Fall)
- United States Army Corps of Engineers, Periodically

The State of California and the Federal Government have similar Inspection Criteria but differ slightly on standards for encroachments, vegetations, and pipelines. Both the State and Federal criteria use the same ratings of:

- A = Acceptable
- M = Minimally Acceptable
- U = Unacceptable

3.0 – STATE OF CALIFORNIA INSPECTIONS

In December 2010, the State of California Department of Water Resources published its Inspection Report of the Central Valley State-Federal Flood protection System (attached). The State inspection Criteria is described in Appendix B of the Inspection Report. The State report also identified the following highlights for 2010:

State Inspection Highlights for 2010

DWR applied the same inspection criteria and overall rating methodology used in the 2007, 2008, and 2009 levee inspections. Overall the system showed continued maintenance improvements since 2007 while the maintenance of the system was found to be similar in 2010 as in 2009.

• Not all inspections were completed in 2010. The Inspections Program suffered major resourcing challenges resulting from severe State budget restrictions including mandatory furloughs and elimination of overtime and flextime. As a result, 382 miles of levees in 31 LMAs, 6 channels, and one pumping plant were not inspected during the summer and fall of 2010. For comparative purposes uninspected levees were assumed to be in the same condition in 2010 as inspected in the fall of 2009.

• The results of the 2010 levee inspections show 38 of the 106 LMAs receiving Unacceptable ratings, increasing from 30 in 2009. The number of LMAs receiving Acceptable ratings decreased from 51 in 2009 to 49 in 2010. The number of LMAs receiving Minimally Acceptable ratings changed from 25 in 2009 to 19 in 2010.
2010 INSPECTION REPORT 3 PUBLISHED DECEMBER 2010

• There was little change in the overall length of deficiencies in 2010 compared to 2009. The length of encroachment and erosion deficiencies increased but was offset by a decrease in other categories.

• DWR continues to follow USACE inspection criteria for most categories, but uses interim vegetation criteria described in California's Central Valley Flood System Improvement Framework document dated March 2009.

• The 2010 inspection yielded 16 channels and 44 structures rated as Acceptable, 3 channels and 11 structures rated as Minimally Acceptable, 1 channel rated as Unacceptable, with no inspections being conducted on 6 channels and 1 pumping plant due to resource limitations discussed above. No ratings are provided for these channels and structure in this report.

• The tool and procedures used in conducting inspections continue to be improved and updated to provide more reliable and accurate data.

In 2009 this report was restructured to allow for greater ease of use and updates. 2010 marks the first update of this new format expediting its publication. Detailed analyses of inspection results are included as an appendix. Background discussion of the Central Valley flood protection system, including relationships between federal, state, and local agencies, and responsibilities outlined in Project O&M manuals are also included as appendices.

Additional 2010 highlights involve other activities within Flood Project Integrity and Inspection Branch (FPIIB).

• FPIIB continued monthly coordination meetings with the USACE to answer questions that both groups have regarding inspections, maintenance practices and recently enacted regulations. 2010 saw greater participation in these meetings by the CVFPB and DWR's Flood Maintenance Office.

• FPIIB staff continued to coordinate with and support the State-Federal Flood Operations Center (FOC) in the conducting and preparation of emergency exercises and assist in the training of Flood Fight Methods and was ready to respond to any flood emergency.

• In 2010 the USACE and its contractors conducted multiple Periodic Inspections. FPIIB participated in coordination with the LMAs, the CVFPB, and the USACE and its contractors throughout the Periodic Inspection process, primarily in facilitating communication between these entities.

• FPIIB provided information for the State Plan of Flood Control Descriptive Document and is contributing to the development of the Central Valley Flood Protection Plan.

DWR continues to improve its inspection program, undergo activities detailing the maintenance condition of features, and works with the LMAs to help ensure a functional flood protection system.
A copy of this annual report and other related reports have been published on-line at http://cdec.water.ca.gov/fsir.html.

4.0 – FEDERAL GOVERNMENT – USACE INSPECTIONS

In September 2010, the United States Army Corps of Engineers published 10 periodic inspection reports for levee systems within the Central Valley of the State of California. Five of the inspected systems were determined to be inactive in the USACE PL84-99 Levee Rehabilitation Funding Program due to unacceptable inspection findings. This increased the total number of inactive systems sponsored by the CVFPB to 36 of 118 systems (see attached USACE Status charts).

In July 2010, The United States Army Corps, Flood Protection and Navigation Section wrote the Central Valley Flood Protection Board to present the Sacramento District's Inspection Flow Chart and Headquarters' Inspection Report template (attached). The purpose of this submission was to unify the local, state, and federal inspections under one common criteria and reporting checklist.

5.0 – STAFF ANALYSIS

Regular detailed inspections are a critical activity necessary to ensure infrastructure performance. Recent disasters such as the San Bruno, California natural gas pipeline explosion, the Deepwater Horizon oil rig explosion, and the Minneapolis Interstate-35 bridge collapse all could have been avoided had more intensive inspections occurred and the findings of those inspections been rapidly addressed through repair or replacement projects. The flood system inspection programs of the USACE, State of California, and local maintaining agencies perform the critical task of ensuring the area's levees, weirs and pump stations will perform as designed during a flood.

Staff Analysis of State DWR Inspection Program - The state inspection program has implemented numerous modernization tools during the last five years. Some examples of these are:

- Digital Levee Mile Logs - Accessible via computer network
- Digital photographs - Excellent photographic records
- GPS Equipped Trucks – Locations are exact
- CVFPB Enforcement Section - Corrects Code Violations

These tools have increased the quantity and quality of information collected during inspections. The use of these tools is an excellent application of State of Art technology to inspection.

The state has three additional inspection ratings for encroachments:

PO – Partially Obstructing Visibility
CO – Completely Obstructing Visibility
W - Watch/monitor

These ratings are not used by the USACE and should be accompanied by a A-acceptable, M – Minimally acceptable or U- unacceptable rating to rate the impact of the encroachment on the flood control system

The Flood Project Integrity and inspection Branch has the equivalent of seven 7 full time inspectors to inspect 1,574 miles of levee, 1,200 of floodway, 26 project channels, and 56 major flood protection facilities. Inspections are required twice a year, during permitted construction, and following enforcement actions.

Staff Analysis of USACE Periodic Inspection Program –

The USACE inspection report template is a detailed 34 page document that lists inspection items, the ratings, and the criteria for the ratings on the same page. This is a good checklist to give to new inspectors because it explains what to inspect and how to rate it. The Sacramento District created a supplemental flow chart to further assist inspectors in determining what items should be rated A, M, or U.

In addition to the A, M, U, ratings the USACE also color coded its inspection results for 2010. Items that were rated U-unacceptable and color coded Red were flagged "Likely prevents performance in next flood event". A single red flagged item was cause for a system to be deemed inactive in the Corps PL-84-99 levee rehabilitation assistance funding program. A system could have its active status restored only after the red flagged item was fixed to the satisfaction of a reinspection.

The recent USACE periodic inspections were completed by consulting engineers through a task order funded by the American Recovery and Reinvestment Act of 2009. Future USACE inspections of this scope and scale will be dependent on future funding decisions as this activity does not have recurring annual funding.

6.0 – STAFF RECOMMENDATION

Board staff recommends all inspection programs strive to use the technology tools created by the State of California and the inspection report templates and flowcharts created by the USACE to conduct inspections. The A, M, U, rating system should be applied to all inspected items. The state ratings such as PO, CO, or W should only be used as supplemental sub-ratings. Color coding the items to dictate the urgency of required corrective action is also good policy. Every system should be made aware of the inspection items that require prompt repairs by red coding those items in the report as the USACE did in its recent inspections.

Both the USACE and the State of California DWR Inspection units need increased resources to adequately inspect the CVFPB Flood Protection system and monitor its permits and enforcement actions. There is no substitute for trained Eye's on the levee.

7.0 – LIST OF ATTACHMENTS

A. DWR – Flood Project Integrity and Inspection Branch Briefing Handouts
B. State of California 2010 Inspection Report of the Flood Protection System
C. United States Army Corp of Engineers Briefing Handouts
D. USACE Inspection Checklist Letter to the Board – July 27, 2010
E. USACE Sacramento District Inspection Flow Chart
F. USACE Flood Damage Reduction Segment/System Inspection Report

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