

Hydrologic Engineering Center  
Training Course on  
INTERIOR FLOODING HYDROLOGY

Davis, California

Course Objectives

The course is designed to provide the participants with a working knowledge of presently available techniques for hydrologic analysis of flood hazard on the landward or interior side of levees and floodwalls. Techniques for evaluating detention basins, gravity outlets, and pumping stations will be considered. Hypothetical event and continuous simulation analysis techniques, will be treated in lectures, problem-solving sessions and case studies. Computer applications will be emphasized.

## INTERIOR FLOODING HYDROLOGY

### Monday

- 8:00- 9:00 a.m.      **INTRODUCTION**
- 9:00- 9:15 am.      Break
- 9:15-10:15 am.      Lecture 1.1:    **PLANNING INTERIOR FLOOD DAMAGE REDUCTION - AN OVERVIEW**
- Definition of the interior flooding problem; planning study objectives; approaches to analysis of interior flood damage reduction alternatives.
- 10:15-11:15 am.      **Lecture 1.2:    FEATURES OF INTERIOR FLOOD DAMAGE REDUCTION MEASURES**
- Physical characteristics of interior areas, system features and components, types of flood damage reduction measures; physical, operational and cost characteristics of gravity outlets, pumps, and other measures.
- 11:15-12:15 p.m.      Lecture 1.3:    **HYDROLOGIC STUDY PROCEDURES**
- Organization of available information, preparation of study plan, initiation of hydrologic investigation; study phases and level of detail.
- 12:15- 1:00 p.m.      Lunch
- 1:00- 1:30 p.m.      **INTRODUCTION TO FIELD RECON/EVALUATION WORKSHOP**
- 1:30- 4:30 p.m.      **Workshop 1.4: FIELD RECON/PREUMINARY EVALUATION - NAPA RIVER PROJECT INTERIOR AREA**
- 4:30- 8:00 p.m.      **ICE BREAKER DINNER, NAPA, CA (Required)**
- 8:00- 9:00 p.m.      Return to Davis, CA

Tuesday

8:00- 9:00 a.m.	REVIEW
9:00- 9:50 am.	Lecture 2.1: <b>HYPOTHETICAL EVENT ANALYSIS</b> Hypothetical event analysis procedures, applicability, example application.
9:50-10:00 am.	Break
10:00-10:50 am.	Lecture <b>2.2:</b> <b>GRAVITY OUTLET ANALYSIS</b> Gravity outlet analysis concepts for interior areas; gravity outlet rating development.
10:50-11:50 am.	Lecture 2.3: <b>MINIMUM FACILITY CONCEPTS AND ANALYSIS</b> Evaluation and selection of a minimum facility as part of the line-of-protection.
11:50-12:00 noon	Class Photo
12:00- 1:00 p.m.	Lunch
1:00- 2:15 p.m.	Lecture <b>2.4:</b> <b>INTERIOR FLOODING HYDROLOGY (HEC-IFH) PACKAGE OVERVIEW</b> Program capabilities and features; description of data entry, computations, and results.
2:15- 2:30 p.m.	Break
2:30- 4:45 p.m.	Workshop <b>2.5: EVALUATION OF MINIMUM FACILITIES USING HYPOTHETICAL EVENT ANALYSIS (HEA)</b>

Wednesday

- 8:00- 8:30 am. REVIEW
- 8:30- 9:30 am. Lecture 3.1: **CONTINUOUS PERIOD-OF-RECORD ANALYSIS APPROACH TO INTERIOR FLOODING ANALYSIS**
- Concepts;** continuous vs. single event analysis; data considerations; computer models; example applications.
- 9:30- 9:45 am. Break
- 9:45-10:45 am. Lecture 3.2: **ANALYSIS OF INTERIOR FEATURES BEYOND MINIMUM FACILITIES**
- Procedures for evaluating additional outlet or pump capacity; stage-frequency relationships for alternative plans.
- 10:50-12:00 noon Lecture 3.3: **CASE STUDY**
- Case study presentation of the interior flood hydrology analysis for the Valley Park Project, St. Louis District.
- 12:00- 1:00 p.m. Lunch
- 1:00- 4:30 p.m. Workshop 3.4: **ANALYSIS OF INTERIOR FEATURES BEYOND THE MINIMUM FACILITY**

Thursda<sup>y</sup>

8:00- 8:45 am. Review

8:45-10:00 am. Lecture 4.1: **SUCCESS IN SELLING INTERIOR FLOOD CONTROL STUDIES**

Overview of what the critical elements are in successfully selling interior flood control studies to the Washington level reviewers. Thru visual from many studies the presentation will illustrate (1) what is success, quality and the role of reviewers, (2) expectations for reporting, (3) critical elements in team work and management plans, (4) key guidance issues and (5) issues not yet in guidance. Any student problems will be discussed during a question and answer period at end.

10:15-10:15 am. Break

10:15-11:30 am. Lecture 4.2: **HYDRAUUC DESIGN CONSIDERATIONS OF INTERIOR FLOODING ANALYSIS**

Overview of problems associated with hydraulic design of gravity outlets and pumping stations.

11:30-12:30 p.m. Lunch

12:30- 1:30 p.m. Lecture 4.3: **ECONOMICS OF INTERIOR FLOOD DAMAGE REDUCTION**

Overview of economic analysis procedures; damage computation for urban areas; damage computation for agriculture areas; benefits computations.

1:30- 1:45 p.m. Break

1:45- 4:45 p.m. Workshop 4.4: **ECONOMIC EVALUATION OF INTERIOR FLOODING PLAN FEATURES**

Friday

- 8:00- 8:40 am. REVIEW
- 8:40- 9:50 am. Lecture 5.1: ISSUES FROM SELECTED CASE STUDIES  
General description of important issues related to major interior flooding projects in the St. Louis District.
- 9:50-10:15 am. Break
- 10:15-10:45 am. **OPEN DISCUSSION - ISSUES/PROBLEMS/QUESTIONS**
- 10:45-11:15 am. COMPLETION ACTIVITIES