# JOINT 8TH IEEE CONFERENCE ON HUMAN FACTORS AND POWER PLANTS
# AND
# 13TH ANNUAL CONFERENCE ON HUMAN PERFORMANCE / ROOT CAUSE / TRENDING / OPERATING EXPERIENCE / SELF ASSESSMENT

August 26-31, 2007, Monterey Marriott, Monterey, CA

IEEE HPRCT

# Meeting Officials

**General Chair**
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*Idaho National Laboratory*

**Publication Chair**
Ronald Boring
*Idaho National Laboratory*

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Pete Bedesem
Pacific Gas & Electric / Diablo Canyon Plant

**Finance Chair**
James Bongarra
*U.S. Nuclear Regulatory Commission*

**Registration Coordinator**
Terri Flores
*Idaho National Laboratory*

# Contributing / Sponsoring Organizations

Through their generous financial contributions and technical sponsorships the organizations listed below have made an outstanding contribution to the success of this 1st IEEE / HPRCT Joint International Conference combining Human Factors and Power Plants and Human Performance, Root Cause, Trending, Operating Experience and Self Assessment.

## Hosted By

Pacific Gas & Electric / Diablo Canyon Plant

Pacific Gas and Electric Company

## Sponsors

IEEE

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INPO

United States Nuclear Regulatory Commission

EPRI Electric Power Research Institute

American Society for Quality

# *Host Welcome Letter*

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***August 26-31, 2007***
***Monterey, CA***

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## Contents

# *Technical Program Committee*

Valerie Barnes
U.S. NRC

Peter Bedesem
PGE

Harold Blackman
INL

Ronald Boring
INL

James Bongarra
U.S. NRC

Andreas Bye
HRP
Norway

Vinh Dang
PSI
Switzerland

Steve Davis
The Excellence Engine, LLC

Dave Desaulniers
U.S. NRC

Terri Flores
INL

Fred Forck
Independent Contractor

Bruce Hallbert
INL

Richard Holman
INL

Karen Jennings
FPL

Jeffrey Joe
INL

Jeffrey Jones
AREVA

Tom Kriesel
INPO

Pierre LeBot
EDF
France

Erasmia Lois
U.S. NRC

Ruiqui Ma
AREVA

Ben Marguglio
High Technology Seminars

Jack Martin
Luminant

Tony Muschara
INPO

Joe Naser
EPRI

John O'Hara
BNL

Julius Persensky
U.S. NRC

Dominique Pirus
EDF
France

Christopher Plott
Alion Science

Pekka Pyy
OECD
France

Isabelle Schoenfeld
U.S. NRC

Oliver Straeter
Eurocontrol
Belgium

Angie Sebok
Alion Science

Belen Torralba
CIEMAT
Spain

Tuan Tran
INL

Unless otherwise indicated TPC participants are from the United States of America.

# Conference Information

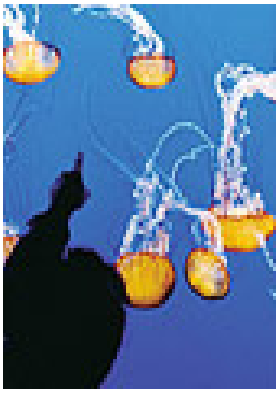
## Local Attractions and Guest Activities

Monterey County – California's greatest meeting of land and sea – offering world-renowned Monterey Attractions along with Sports and Recreational events.

From the dramatic Big Sur coastline to romantic Carmel by the Sea and Pebble Beach, to historic Monterey and its diverse peninsula communities, to the fertile Salinas Valley, Monterey County offers a rich and complete variety of destinations. You might want to include attractions such as: Old Fisherman's Wharf and Cannery Row in downtown Monterey should be on the "must-do" list of every visitor to the area. This is a great place to take in the sights and sounds and *smells* of Monterey.

Because neighboring Wharf 2 is the heart of the area's thriving fishing industry, you can usually watch the working trawlers unloading the catch of the day — just look for all of the seagulls hoping for a handout to know who's had a successful day on the Bay! Stroll down the wharf with a cup of hot clam chowder, or stop by one of several restaurants featuring fresh Monterey Bay seafood.

You can photograph sea lions and otters frolicking in the calm inner harbor waters, or if you're feeling more adventurous,



take to the waters with a glass bottom boat tour, deep-sea fishing trip or whale watching tour. Monterey Bay offers year-round whale watching. There are numerous outlets which offer trips to observe the spectacular diversity and abundance of whales and dolphins inhabiting the bay.

There are always new reasons to visit the Monterey Bay Aquarium—special events, exciting exhibits, new animals and family activities. Discover why they are recognized as the nation's finest aquarium and No. 3 top-rated family attraction in the United States.*

If it's a day on the greens you are after, you've come to the right place. Consistently named among the world's number one golf destinations in surveys by *Golf Digest Magazine*, Monterey County is home to some pretty spectacular fairways, including the legendary Pebble Beach Golf Links. Whether you're planning a golfing vacation or just a leisurely afternoon on the greens, Monterey County has over 20 public golf courses to choose from. Tee up on your next visit and see why Monterey County is known as the Golf Capital of the World. Visit the Monterey County Golf association for more information on individual courses.

The John Steinbeck Exhibition Hall presents the life of John Steinbeck, his writings and characters in an informative and entertaining manner through engaging exhibitry, one of a kind artifacts, educational programs, and films. There are interactive multi-sensory exhibits for all ages with seven themed theaters showcasing Cannery Row, The Grapes of Wrath, East of Eden, Of Mice and Men, The Red Pony and much more.

For additional information on available activities in Monterey check out the Monterey Area Attractions tab on our webpage: http://ewh.ieee.org/conf/hfpp

# *Registration*

## Conference Registration

Registration is required for all attendees and presenters. Badges are required for admission to all events. The Full Conference Registration fee includes technical sessions, a copy of the proceedings and gala events. The conference registration desk will be located in the San Diego room at the hotel. The San Diego room is located on the second floor Mezzanine area.

**Student Registration** includes technical sessions and a copy of the proceedings. A full-time student ID is required. Student registration does not include tickets to any events.

**Pre-Conference Training**
We are pleased to offer several pre-conference training options on Sunday, August 26, 2007. There are full-day and half-day courses to choose from. Please check out the Pre-Conference Training Section on page 9 for more details.

## Registration Hours

The Conference Registration Desk and Message Center will be located in the Monterey Marriott located in the San Diego room. You may register, purchase tickets for events, or pick up your registration packet during the following hours:

Saturday, August 25, 2007
2:00 PM – 4:30 PM

Sunday, August 26, 2007
7:30 AM – 5:00 PM

Monday, August 27, 2007
7:30 AM – 5:00 PM

Tuesday, August 28, 2007
7:30 AM – 5:00 PM

Wednesday, August 29, 2007
7:30 AM – 5:00 PM

Thursday, August 30, 2007
7:30 AM – 5:00 PM

## Cancellations

Registrations canceled prior to August 6, 2007 will receive a full refund. Cancellations received after August 6, 2007, will be subject to a 20% processing fee.

## Plenary Speakers Information

**Jack Keenan** joined Pacific Gas and Electric Company as Senior Vice President, Generation and Chief Nuclear Officer in December 2005. He is responsible for all of PG&E's power generation assets, including nuclear, fossil and hydroelectric as well as the strategic

direction and financial success in the following power generation sectors: nuclear, fossil, hydroelectric, cogeneration and renewables. Mr. Keenan is responsible for the safe and reliable operations of Diablo Canyon Power Plant and is the lead contact with the Nuclear Regulatory Commission and the Institute of Nuclear Power Operations (INPO).

Mr. Keenan has three decades of experience in nuclear generation, including system engineering, outage management, maintenance and operations. Most recently, Jack served as Vice President, Fossil Generation at Progress Energy in North Carolina. Previously, he has held leadership positions at Progress Energy's Brunswick Nuclear Plant and Robinson Nuclear Plant and managerial positions at Northeast Utilities' Millstone Nuclear Power Station. Under his leadership, the nuclear plants obtained INPO-1 ratings.

Mr. Keenan holds a bachelor's degree in mechanical engineering from Worcester Polytechnic Institute, in Massachusetts, and an MBA from Rensselaer Polytechnic Institute in Connecticut.

The Honorable **Peter B. Lyons** was sworn in as a Commissioner of the U.S. Nuclear Regulatory Commission on January 25, 2005. Dr. Lyons brings to the NRC eight years of experience as a science advisor to Sen. Pete Domenici (R-N.M.) and the Senate Energy and Natural Resources Committee. From 1997 to 2002, he focused on military and civilian uses of nuclear technologies, national science policy and nuclear nonproliferation. More recently, he was involved with issues on national and international nuclear policy, energy research and development, and hydrogen technology.

From 1969 to 1996, Dr. Lyons worked in progressively more responsible positions at the Los Alamos National Laboratory. During that time he served as director for industrial partnerships, deputy associate director for energy and environment, and deputy associate director-defense research and applications. While at Los Alamos, he spent over a decade supporting nuclear test diagnostics.

Dr. Lyons has published more than 100 technical papers, holds three patents related to fiber optics and plasma diagnostics, and served as chairman of the NATO Nuclear Effects Task Group for five years.

A native of Nevada, Dr. Lyons received his doctorate in nuclear astrophysics from the California Institute of Technology in 1969 and earned a bachelor's degree in physics/math from the University of Arizona in 1964. He is a Fellow of the American Physical Society.

In addition, Dr. Lyons was elected to 16 years on the Los Alamos School Board and spent six years on the University of New Mexico-Los Alamos Branch Advisory Board. He is a resident of Virginia.

**Phillip J. Finck, Ph.D.**

- **Technical Integration Office Director for GNEP**
- **INL Associate Laboratory Director for Nuclear Science & Technology**
- **Fellow of the American Nuclear Society**

Dr. Finck received his doctorate in nuclear engineering at MIT in 1982, and also holds an MBA from the University of Chicago. He was a mechanical engineer at Novatome, a reactor in France, from 1983 to 1986, and was involved in the safety and design of fast reactors, including France's Superphénix. In 1986, he joined the staff at Argonne National Laboratory (ANL) in neutronics methods development for the Integral Fast Reactor concept, and later for the New Production Reactor. In 1991, he became the lead for neutronics analyses for Experimental Breeder Reactor-II. In 1993, he joined the French Atomic Energy Commission, where he was head of the Reactor Physics Laboratory at the Cadarache Center, with activities in light-water reactors and liquid-metal reactors, criticality safety, fuel cycle physics and nuclear data. In 1995, he was elected to chair the European Nuclear Data Project. In 1997, he rejoined ANL, where he was Associate Director of the Technology Development Division. He has led activities in the Advanced Accelerator Applications program since 2000, and has been heavily involved in transforming the program from accelerator-based to reactor-based transmutation. In 2003, he was named ANL Deputy Associate Laboratory Director for Engineering Research. On April 11, 2006, he was named ANL Associate Laboratory Director for Applied Science and Technology, where he was responsible for coordination of all nuclear energy-related activities at Argonne, including Advanced Fuel Cycle Initiative and Generation-IV programs, and development of new initiatives. On October 19, 2006, Dr. Finck joined the Idaho National Laboratory (INL) and was named Associate Laboratory Director for Nuclear Science & Technology. He is also the Technical Integration Office Director for the Global Nuclear Energy Partnership.

## Conference Proceedings

This year's conference proceedings will be on CD-ROM. Copies of the Conference Proceedings will be available at the conference. Each full conference registrant will receive a copy of the proceedings as part of the full registration fee.

Conference presentations will be available on the conference website. Participants will be able to download presentations for a 3 month period of time after the conference. A computer will be available for each session track and presenters will need to upload their final presentations onto that computer. The Publications Committee will see that the final presentations are placed on the conference website.

## Conference Special Events

*Please note:*
*You must be registered for the meeting to attend evening events.*

***Opening Reception***
Monday, August 27, 2007
6:00 PM – 8:00 PM
Location: Ferrantes Bayview
Each additional ticket price is $20.

***Conference Social***
Wednesday, August 29, 2007
3:30 PM – 5:00 PM
Location: Ferrantes Bayview
Each additional ticket price is $20.

## International Participants

**Procedures for International Participants *to Register for conference***

Apply early for a United States Visa, include invitation letter in your Visa application. You may request the invitation letter from the conference secretary, Theresa Flores, at Theresa.flores@inl.gov. A letter will be provided after you have registered for the conference and will include your registration number along with your paper number if you are a presenter.

## Visa Information

A citizen of a foreign country, wishing to enter the U.S., generally must first obtain a visa, either a nonimmigrant visa for temporary stay, or an immigrant visa for permanent residence. The type of visa you must have is defined by immigration law, and relates to the purpose of your travel.

To learn more, read the step-by-step guide to the visa process at the United States Visas Homepage at the following url: www.unitedstatesvisas.gov.

# *Professional Development Workshops*

*Sunday, August 26, 2007*

## *Essential Soft-skills for Investigators and Assessors*

Instructor: Dr. Tyrone S. Tonkinson, President, Simple Approach, Inc.
Time: 8:00 AM – 5:00 PM
Location: San Carlos 2

Most Root Cause Analysis training focuses on the technique, which usually involves some form of companion software. How effective will the technique be if the investigator is unable to get those being assessed to divulge the real reasons for undesired performance? Have you heard the expression “garbage in, garbage out?” This one-day skill development seminar is designed to provide root cause investigators and organizational assessors a set of soft-skills necessary to successfully research the deeper reasons for personnel and organizational under-performance. The presentation will be highly interactive to engage the participants and enhance their learning. The seminar is based on over 20 years of experience and thousands of investigations, and will include:

- Sponsorship and the team charter
- Planning for success
- Decoding documents and artifacts
- Developing rapport while maintaining independence
- Active listening
- Interviewing
- Conflict management and negotiation
- Gaining commitment for corrective actions
- Writing for impact
- Personal continuous improvement

This 1-day interactive seminar will provide the skills and confidence to be a much more effective investigator and assessor. This seminar will include a reference book about the essential skills, several in-class exercises, and copies of the slides.

## *Human Error Prevention*

Instructor: Ben Marguglio, High Technology Seminars, LLC
Time: 8:00 AM – 5:00 PM
Location: San Carlos 4

**Overview:**

In addition to discovery and invention, human error prevention can be the greatest contributor to improved productivity, safety and quality. This seminar provides the most current developments in human error prevention and mitigation and amelioration of the undesired effects of hazards actuated by human error. This seminar is unique in its approach, particularly with regard to Marguglio's Human Error Causal Factor Taxonomy, which better enables the identification human error root causes.

**Audience:**

This seminar is designed for anyone whose objective is to improve productivity, safety and quality. The principles and practices of human error prevention and error effects mitigation/amelioration are universally applicable regardless of the type of industrial, commercial or governmental enterprise, and regardless of the type of function performed within the enterprise.

**Learning Outcomes:**

Upon completion of this seminar, one will be able to:
• Understand and use human performance and human error prevention terminology;
• Classify human error from different perspectives;
• Understand and recognize human error causal factors;
• Understand and use barriers to prevent human error which activates hazards, and barriers to mitigate and ameliorate the undesired effects of hazards, as well as techniques by which to strengthen the barriers;
• Recognize error-inducing conditions and error-likely situations, and understand and use behavioral techniques to counteract these conditions / situations.

**Marguglio's Human Error Causal Factor Taxonomy:**

| ***Causal Factor*** | ***Description*** |
|---|---|
| Knowledge-based | Error based on lack of knowledge of the standard, requirement or need. |
| Cognition-based / Skill-based | Error based on lack of the appropriate level of cognition; lack of ability to understand, apply, analyze, synthesize or evaluate such as to be able to meet the standard, requirement or need. |
| Value-based / Belief-based | Error based on lack of respect for or acceptance of the standard, requirement or need. |
| Error-Inducing Condition-based / Error-Likely Situation-based | Error based on lack of recognition of the condition or situation and/or lack of counteracting behavior. |
| Decision-based | Error based on lack of judgment in evaluating risk versus benefit. Lack of behavioral techniques for conservative decision-making. |
| Skill-based | Error based on lack of physical dexterity. |
| Lapse-based | Nothing lacking; simply "blew it". |

## *Workload Assessment Methods Tutorial*

Instructor: Angelia Sebok
Time: 8:00 AM – 11:00 PM
Location: Santa Monica

This 3 hour tutorial session will address accepted and widely used methods for assessing and predicting operator workload demands in nuclear power plant operations. We will review methods for assessing workload in existing facilities (i.e., captured directly from those experiencing the workload) and projective methods used in conjunction with human performance modeling to predict workloads in proposed configurations. We will describe the merits and applicability of these workload assessment tools and provide guidance in selecting the appropriate workload assessment method based on the goals of the analysis. We will cover the NASA/TLX and VACP approaches in greater detail. We will provide concrete examples from real data captured, in part, from studies conducted at the OECD Halden research facility.

## *Getting to Safety Culture from the Root Cause Analysis*

Instructor: Dr. William Corcoran, Nuclear Safety Review Concepts Corporation
Time: 8:00 AM – 12:00 PM
Location: San Carlos 3

**Theme:** We all know in our guts that the safety culture was part of the causation, but we struggle with the logical case. In this workshop we'll get practice in applying a step-by-step process in a collaborative workshop setting.

**Who Should Attend:** Leaders and individual contributors whose work relates to root cause analysis and/or safety culture in the high hazard industries. This includes operations, regulatory affairs, corrective actions, employee concerns, safety conscious work environment, and related endeavors.

**Background:** We will discuss what safety culture is in detail. Basically, safety culture is that part of culture that affects safety. Culture is made up of shared aspects of a group. It consists of mental content, behavioral norms, institutions, and characteristic physical items. (Mental content can be backed out of the combination of behaviors, institutions, and physical items.)

**Process:** In going from root cause analysis to safety culture the step-by-step process is:

1. Determine the factors that affected the nature, the magnitude, and the timing of the key consequences. (Done by ordinary root cause analysis methods.)
2. Characterize the factors as behavior factors, institutional factors, and physical item factors.
3. Determine the extent of the factors to decide whether they are culture or aberrations.
4. Collect the cultural results.

**Inputs:** The workshop leader will bring a few high profile nuclear and other high hazard industry root cause analysis reports for walk-throughs by the workshop. Participants will be invited to bring their own favorite investigation reports to work in the group. They can be redacted reports from their own organization or reports downloaded from the internet.

We will also be using event videos from the U. S. Chemical Safety and Hazard Board (CSB) to explore how safety culture affects the causes of high hazard industry events. The workshop will be designed to be highly informal and highly interactive. The workshop will be “paperless” in that all materials other than the videos and participant inputs will be distributed in advance by e-mail. Be sure to put your e-mail address in your registration and, as a back-up, notify the workshop leader of your registration at William.R.Corcoran@1959.USNA,com

## *Human Performance 202 – Getting More Out of Human Performance Training*

Instructor: Rob Fisher, President, Fisher IT, Inc.
Time: 8:00 AM – 12:00 PM
Location: San Carlos 1

A 4-hour interactive learning session for human performance professionals to:

- Experience new ways to talk to your people about being the final barrier in the defense in depth concept;
- Improve communication of basic human performance concepts and fundamentals to your personnel; and
- Provide new ways to look at procedure compliance issues.

## *Change Management and Organizational Alignment Working Sessions*

Instructor: Gil Crosby, Crosby & Associates, former Senior Organizational Development Specialist at Peach Bottom Atomic Power Station and Mark Horswood, Senior Consultant, Crosby & Associates, former Electrician in heavy manufacturing environment

Time: 1:00 PM – 5:00 PM
Location: San Carlos 1

**Theme:** Working change management strategy session for attendees' current initiatives, and for building alignment in support of their ongoing role in the organization

**Who Should Attend:** Managers and/or individual contributors who are responsible for implementing change or influencing the organization outside their immediate span of control

**Background:** Participants will apply industry specific and universal change management theory and methods to an analysis of their own organizational human performance initiatives. They will devise strategies based on their analysis. In addition, they will be invited to assess and devise strategies towards maximizing the ongoing effectiveness of their role within the organization.

**Process:**

1. Participants will be familiarized with pertinent behavioral science and change management theory, grounded in the approach that was used to shorten outage length and change the culture at PECO Nuclear following the Peach Bottom shutdown by the NRC
2. Participants will apply said theory to analyzing their own behavior and their own approach to influencing the organization
3. Participants will devise a strategy for increasing their impact on their organization

**Preparation and Additional Information:** Participants should come to the workshop prepared to assess their current initiatives, as well as to assess their effectiveness at building alignment in support of their ongoing role in the organization. You *do not* need to bring any materials or information in order to conduct the type of assessment that we are proposing.

Teams from the same organization will work together during the session, and individuals will work in tandem with a peer from another organization.

Crosby & Associates would appreciate it if you would notify them in advance at gilmorecrosby@comcast.net of your intention to attend.

## *Cause Evaluation Using the Cause Roadmap*

Instructors: Steve Davis and Chet Rowe
Time: 1:00 PM – 6:00 PM
Location: San Carlos 3

This five hour course, taught by experienced event investigators, will provide attendees with an overview of various tools used in a cause evaluation and how to integrate them with the Excellence Engine's **Cause Road Map©** to achieve improved cause analysis results.

The **Cause Road Map©** is an event investigation tool that is designed to aid users in performing investigations for both equipment and human performance related events. **The result is corrective actions that fix problems, not symptoms.**

Learn how the Cause Road Map© can help you during the planning and investigation phases and help you validate your investigation findings.

The Cause Road Map©, developed by the Excellence Engine, is an easy-to use tool that is designed to aid investigators in identifying underlying and latent causes of events. The Cause Road Map© has its roots in the Institute of Nuclear Power Operation's Anatomy of an Event Model which provides the basic concepts for doing any cause investigation. The Cause Road Map© is a series of hierarchical logic steps (displayed in six different "Maps") that are designed to aid investigators in identifying the
underlying causes for both equipment failures and human performance errors.
**Course Objective**:

Understand:

- how to use the **Cause Road Map©** and other investigation tools
- the use of cause evaluation tools to identify underlying cause(s) of an event
- how to select effective corrective and preventive actions
- the elements of an effective cause evaluation report
- the elements of an effective presentation

**Course Participants will be provided:**

- Copy of all presentation materials
- CD of various templates

**Instructors:**
**Steve Davis** started his consulting and educational services following his retirement from Constellation Energy. He has over 30 years experience in the commercial nuclear industry, 27 years at Constellation Energy's Calvert Cliffs Nuclear Power Plant and five at Nine Mile Point Nuclear Station. For over 16 years, Steve was the company's "go-to guy" for cause investigations. He specializes in equipment related problems but is equally adept at performing human performance related investigations.

**Chet Rowe's** over 30 years experience in the commercial nuclear industry has included investigations of the causes of many significant events. Chet is the creator of the Cause Road Map© taxonomy for cause investigations and has been trained in numerous problem solving techniques. Chet has an extensive background in Quality Assurance (QA), Corrective Action Programs (CAP) and Engineering at five nuclear power plants.

# *Technical Program Highlights*

*Color Legend:* **Registration** **Workshops** **Technical Sessions**

## Saturday, August 25, 2007

| | | |
|---|---|---|
| ***2:30 pm – 5:00 p.m.*** | ***Meeting Registration*** | ***San Diego*** |

## Sunday, August 26, 2007 — Professional Development Workshops

| | | |
|---|---|---|
| ***7:30 a.m. – 5:00 p.m.*** | ***Meeting Registration*** | ***San Diego*** |
| **8:00 a.m. – 5:00 p.m.** | **Essential Soft-Skills for Investigators and Assessors – Dr. Tyrone S. Tonkinson – San Carlos 2** | |
| **8:00 a.m. – 5:00 p.m.** | **Human Error Prevention – Ben Marguglio – San Carlos 4** | |
| **8:00 a.m. – 12:00 p.m.** | **Workload Assessment Methods Tutorial – Christopher Plott and Angelia Sebok – Santa Monica** | |
| **8:00 a.m. – 12:00 p.m.** | **Getting to Safety Culture from the Root Cause Analysis – Dr. William Corcoran – San Carlos 3** | |
| **8:00 a.m. – 12:00 p.m.** | **Human Performance 202 - Getting More Out of Human Performance Training - Rob Fisher – San Carlos 1** | |
| **1:00 p.m. – 5:00 p.m.** | **Change Management and Organizational Alignment Working Sessions – Gil Crosby – San Carlos 1** | |
| **1:00 p.m. – 6:00 p.m.** | **Cause Evaluation Using the Cause Roadmap – Steve Davis and Chet Howe – San Carlos 3** | |

## Monday, August 27, 2007

| | | |
|---|---|---|
| ***7:30 a.m. – 5:00 p.m.*** | ***Meeting Registration*** | ***San Diego*** |
| **8:30 a.m. – 10:00 a.m.** | **Plenary Session** | **San Carlos 1- 4** |
| ***10:00 a.m. – 10:30 a.m.*** | ***Morning Break*** | |
| **10:30 a.m. – 12:00 p.m.** | **Plenary Session *(Continued)*** | **San Carlos 1 - 4** |
| ***12:00 p.m. – 1:30 p.m.*** | ***Lunch Break*** | |

## Monday, August 27, 2007

**1:30 p.m. – 3:00 p.m. Technical Sessions**

### New Technology Applications for Generation III+ Deployment, Ted Quinn and William Kemper – Co-Chairs – San Carlos 3

**107 – Miljko Bobrek, Richard T. Wood, Christina D. Ward, Stephen M. Kollough, Don Bouldin, Michael E. Waterman:**
*Safe FPGA Design Practices for Instrumentation and Control in Nuclear Plants*

### Learn Safe I, Björn Wahlström – Chair – San Carlos 4

**101 - Hans Maimer:**
*Learning from Low Level Events - Experience With an Electronic Tool Supporting the Report of Events, Evaluation, Analysis, and the Corrective Action Program Corrective Action Program*

**100 - Carl Rollenhagen and Joakim Westerlund:**
*Development of a Safety Climate Questionnaire for Nuclear Power Plants*

**99 - Björn Wahlström and Carl Rollenhagen:**
*Organizational Factors and Nuclear Safety – Issues to Address in Research and Development*

### Trending, Ben Marguglio - Chair – San Carlos 1

**20 - Jung-Woon Lee, Tong-Il, Dae-Ho Kim and Jaekyu Park:**
*A Proposition of Human Factors Approaches to Reduce Human Errors in Nuclear Power Plants*

**24 - Dale Wuokko:**
*Learning from Human Performance Cross-Cutting Aspects of Inspection Findings*

### Managing Safety Culture & Change Management, Kay Gallogly - Chair – San Carlos 2

**18 - Edward Kennedy:**
*Integrating and Institutionalizing Human Performance Improvement into a DOE Integrated Safety Management System Continuous Improvement Program*

**19 - Edward Kennedy:**
*Initial Steps to Effectively Implement and Integrate HPI into a DOE Integrated Safety Management System*

**56 - Gil Crosby:**
*Culture Can Be Built: Lessons from the PECO Nuclear Turnaround - A Strong Nuclear Safety Culture and a High Productivity Culture are Based on the Same Behavioral Foundations, ad can be Reliably Implemented and Sustained*

***3:00 p.m. – 3:30 p.m. Afternoon Break***

## Monday, August 27, 2007

**3:30 p.m. – 5:00 p.m.** **Technical Sessions**

**New Technology Applications for Generation III+ Deployment II, Ted Quinn and William Kemper – Co-Chairs – San Carlos 3**

**Don W. Miller, Mehdi Reisi-Fard, Xiaodong Sun, Thomas E. Blue, Steven Arndt:**
*A Review on Gamma Thermometer Applications in Nuclear Reactors*

**Learn Safe I, Björn Wahlström – Chair, Panel Discussion – San Carlos 4**

***98*** **– Björn Wahlström:**
*The Learn Safe Project; a Three Year Perspective*

**Trending, Ben Marguglio - Chair – San Carlos 1**

**35 – George Tasick:**
*Making the Transition from Trending to Performance Assessment at Entergy FitzPatrick*

**79 - Jeff Sword:**
*How Do You Know What You Don't Know? Detecting "Hidden Trends" in Performance*

**HU Networking Boards, Karen Jennings – Chair – San Carlos 2**

***6:00 – 8:00 p.m.*** ***GALA RECEPTION IN FERRANTES BAYVIEW ROOM***
***Monterey Marriott Hotel, 10th Floor***

## Tuesday, August 28, 2007

***7:30 a.m. – 5:00 p.m.*** ***Meeting Registration*** ***San Diego***

**8:30 a.m. – 10:00 a.m.** **Technical Sessions**

### Empirical Testing of HRA Methods I, John Forester – Chair – San Carlos 3

**77 – Vinh N. Dang, Andreas Bye, Erasmia Lois, John Forester, Alan M. Kolaczkowski and Per Øivind Braarud:**
*An Empirical Study of HRA Methods - Overall Design and Issues*

**65 – Helena Broberg and Alan M. Kolaczkowski:**
*Constraints in Designing Simulator Scenarios and Identifying Human Failure Events for Testing HRA Methods*

**78 - John Forester, Alan M. Kolaczkowski, Vihn N. Dang and Erasmia Lois:**
*Human Reliability Analysis (HRA) in the Context of HRA Testing with Empirical Data**

### IEEE Root Cause Standard, Angelia Kozak- Chair – San Carlos 1

**Angie Kozak:**
*Presentation on IEEE Standard Current Status followed by group discussion on need for standardization*

### Safety Culture for New Reactors, Christer Viktorsson - Chair – San Carlos 4

**Ronald Vijuk:**
*Safety Culture and the AP1000 Plant Design*

**74 - Nina Koivula:**
*New Reactor and Safety Culture Considerations in Finland-Oversight of Organizational Factors*

**Christer Viktorsson:**
*IAEA Safety Culture Assessment for Design Organizations*

**E. Mathet:**
*Safety Culture Considerations for New Designs*

### INPO Initiatives, Karen Jennings - Chair– San Carlos 2

**59 - Tony Muschara:**
*INPO's Approach to Human Performance in the United States Commercial Nuclear Power Industry*

**91 - Tom Kriesel:**
*Industry Human Performance Indicators Comparison Project*

***10:00 a.m. – 10:30 a.m.*** ***Morning Break***

## Tuesday, August 28, 2007

**10:30 a.m. – 12:00 p.m.** **Technical Sessions**

### The MERMOS Method, Erasmia Lois – Chair – San Carlos 3

**85 – Pierre LeBot, Hélène Pesme and Patrick Meyer:**
*The CICA Concept for use in the MERMOS Method Redefined by a New Organizational Reliability Model*

**86 – Patrick Meyer, Pierre LeBot and Hélène Pesme:**
*MERMOS: an Extended Second Generation HRA Method*

**87 - Hélène Pesme, Pierre LeBot and Patrick Meyer:**
*Little Stories to Explain Human Reliability Assessment: A Practical Approach of the MERMOS Method*

### Safety Culture – Assessments and Follow-up, Sonja Haber – Chair – San Carlos 4

**55 - Sonja Haber, Deborah Shurberg and Kay Gallogly:**
*Effecting Positive Safety Culture Change*

**84 - Lars Axelsson:**
*Safety Culture Enhancement and Safety Leadership*

**Craig Rierersen:**
*Maintaining Oversight of Licensee Safety Culture – Developing Approach of the UK Nuclear Installations Inspectorate*

### Root Cause, Steve Davis - Chair – San Carlos 1

**02- Mark Paradies:**
*Improving an Existing Root Cause Analysis and Corrective Action Program*

### Plant Initiatives, Jack Martin - Chair – San Carlos 2

**25-Dale Wuokko:**
*Application of a Plant Performance Improvement Model and Implementing Processes*

**70- Hank Strahley, Leigh DeRue and Jeremy Titus:**
*Setting the Standards in the Human Performance*

***12:00 p.m. – 1:30 p.m.*** ***Lunch Break***

**1:30 p.m. – 3:00 p.m.** **Technical Sessions**

### New HRA Perspectives, Ronald Boring – Chair – San Carlos 3

**47 - Lila Laux and Christopher Plott:**
*Using Operator Workload Data to Inform Human Reliability Analyses*

**42 - Jaewhan Kim, Wondea Jung and Jinkyum Park:**
*AGAPE-ET: Advanced Guidelines for Human Reliability Analysis of Emergency Tasks*

**60 – April M. Whaley, Ronald L. Boring, Harold S. Blackman and Patrick H. McCabe, Bruce P. Hallbert:**
*Lessons Learned from Dependency Usage in HERA: Implications for First-Generation HRA Methods*

## Tuesday, August 28, 2007

**1:30 p.m. – 3:00 p.m.** **Technical Sessions *(Continued)***

### Safety Culture Applications and Research, Debbie Fisher – Chair – San Carlos 4

**07 – Debbie Fisher:**
*Cultural Aspects of an Incident Reporting and Investigation System within a Licensed Site in the UK Nuclear Industry*

**09 – Jussi K. Vaurio: Unable to present at conference**
*Human Factors and Risks in a Periodic Safety Review of a Nuclear Power Plant*

**64 - Kristiina Hukki and Jan-Erik Holmberg:**
*Systemic Approach to Development of Risk-Informed Management of Fire Situations at Nuclear Power Plants*

### Root Cause, Steve Davis – Chair – San Carlos 1

**11 - Tyrone S. Tonkinson:**
*SAI's Behavior-Based Root Cause Analysis*

### Simplified Approaches to Improving Performance, Rob Fisher – Chair – San Carlos 2

**97 - Rob Fisher:**
*Simplified Approaches to Improving Performance*

***3:00 p.m. – 3:30 p.m.*** ***Afternoon Break***

**3:30 p.m. – 5:00 p.m.** **Technical Sessions**

### HRA for Non-Reactor Applications, Nathan Sui – Chair – San Carlos 4

**Susan Cooper and Tina Ghosh:**
*Key HRA Messages for High Level Waste*

***William Brown, John Wreathall and Susan Cooper:***
*HRA-Informed Perspective on Human Errors in Medical Applications*

**Jeffrey D. Brewer and Paul Amico:**
*HRA-Informed Insights on Spent Fuel Handling and Cask Operations*

### Safety Culture Applications and Research, Debbie Fisher – Chair – San Carlos 3

**30- Teemu Reiman and Pia Oedewald:**
*Organizational Factors and Safe Human Performance – Work Psychological Model*

**12 – Carl Rollenhagen and Björn Walhström:**
*Management Systems and Safety Culture; Reflections and Suggestions for Research*

**71 – Rosario Sola and Inmaculada Silla:**
*Organizational Culture and Safety Expectations: The Mediating Role of Trust in Supervisors*

## Tuesday, August 28, 2007

**3:30 p.m. – 5:00 p.m.** **Technical Sessions *(Continued)***

### Integrated Operations, A. Droivoldsmo, - Chair – San Carlos 1

**13 - Tuan Q. Tran, Humberto E. Garcia, Ronald L. Boring, Jeffrey C. Joe and Bruce P. Hallbert:**
*Human Factors Issues for Multi-Modular Reactor Units*

**95 - Asgeir Droivoldsmo, Jim L. Kvamme, Espen Nystad, Linda Sofie Lunde-Hanssen, Ronny Larsen and Tore Berge-Leversen:**
*Integrated Operations and Insights on Functional Analysis Techniques*

**89 - Bjorn Holst and Espen Nystad:**
*Oil & Gas Offshore / Onshore Integrated Operations - Introducing the Brage 2010+ Project*

### Human Performance, Panel Discussion, Karen Jennings - Chair – San Carlos 2

## Wednesday, August 29, 2007

***7:30 a.m. – 5:00 p.m.*** ***Meeting Registration*** ***San Diego***

**8:30 a.m. – 10:00 a.m.** **Technical Sessions**

**Human Factors Design Tools, Angie Sebok, - Chair – San Carlos 3**

**21 - Tong IL Jang, Jae-Kyu Park, Dae-Ho Kim, Jung Woon Lee and Yong Hee Lee:**
*An Experimental Evaluation of Flowchart Type Operating Procedure for Nuclear Power Plants*

**54 - Jan Eric Larsson, Joseph DeBor:**
*Real-Time Root Cause Analysis for Complex Technical Systems*

**Empirical Basis for Human Reliability Analysis, Harold Blackman – Chair – San Carlos 4**

**14 - Tuan Q. Tran, Ronald L. Boring, Jeffrey C. Joe and Candice D. Griffith:**
*Extracting and Converting Quantitative Data into Human Error Probabilities*

**48 - Ronald L. Boring, Candice D. Griffith and Jeffrey C. Joe:**
*The Measure of Human Error: Direct and Indirect Performance Shaping Factors*

**57 –Ronald L. Boring and Harold S. Blackman:**
*The Origins of SPAR-H Method's Performance Shaping Factor Multipliers*

**Vinh N. Dang:**
*An Initiative Aimed at Collecting and Exchanging Data for Human Reliability Analysis*

**Apparent Cause Evaluation & Problem Identification & Resolution, Steve Davis - Chair– San Carlos 1**

**83 – Steve Davis and Chester Rowe:**
*Apparent Cause Evaluation Myths*

**80 – Dana Cooley and Jack Martin:**
*Dodge the Bullet - Ways to Avoid PI & R Issues and CAP-Related AFIs*

**Performance Improvement Modeling, Karen Jennings - Chair – San Carlos 2**

**01 - Mark Paradies:**
*Positive vs. Negative Enforcement: Which Promotes High Reliability Human Performance*

***10:00 a.m. – 10:30 a.m.*** ***Morning Break***

## Wednesday, August 29, 2007

**10:30 a.m. – 12:00 p.m.** **Technical Sessions**

### Human Behavioral Modeling, Angie Sebok – Chair – San Carlos 3

**39 – Tuan Q. Tran, Karen M. Feigh and Amy R. Pritchett:**
*Supporting Multiple Cognitive Processing Styles Using Tailored Support Systems*

**51 – Tuan Tran, David I. Gertman, Donald D. Dudenhoeffer, Ronald L. Boring and Alan R. Mecham:**
*Cognitive Virtualization: Combining Cognitive Models and Virtual Environments*

**73 - Par Axelsson, Kelly S. Hale and Sven Fuchs:**
*Optimizing Information Displays using Multimodal Design Science*

### Use of Simulator Data for HRA, Vihn N. Dang – Chair – San Carlos 4

**40 – Wondea Jung, Jinkyun Park and Jaewhan Kim:**
*A Simulator Study and its Application to an HRA in NPPs*

**61 - Ronald L. Boring, April M. Whaley, Bruce P. Hallbert, Karin Laumann, Per Øivind Braarud, Andres Bye, Erasmia Lois and Yung Hsien James Chang:**
*Capturing Control Room Simulator Data with the HERA System*

**88 - Pierre LeBot, Helene Pesme and Patrick Meyer:**
*Collecting Data for MERMOS Using a Simulator*

### RCA Back to Basics, Steve Davis - Chair – San Carlos 1

**94 - William Corcoran:**
*Safety Culture - Back to the Basics*

### Human Performance Integration, Karen Jennings - Chair – San Carlos 2

**58 – William Rigot and Bruce Hart:**
*Implementation of Department of Energy Human Performance Initiative at the Savannah River Site with a well established Behavior Based Safety Program*

**82 –Marta Juhasz and Julianna Katalin Soos: Unable to present at conference**
*Impact of Non-Technical Skills on NPP Teams' Performance: Task Load Effects on Communication*

**109 – Robert Richards and Sheri Martin:**
*Human Performance Improvement Implementation at Idaho National Laboratory: Milestones, Successes and Lessons Learned*

***12:00 p.m. – 1:30 p.m.*** ***Lunch Break***

## Wednesday, August 29, 2007

**1:30 p.m. – 3:00 p.m.** **Technical Sessions**

**Role of International Organizations, Craig Reiersen – Chair – San Carlos 3**

*Presentations made by:*
*CSNI – Craign Reiersen*
*IAEA – Christer Viktorsson*
*INPO – Tony Muschara*

**Empirical Testing of HRA Methods II, Andreas Bye – Chair – San Carlos 4**

*Panel Discussion on the International Empirical Study of HRA Methods*

**Trending, Panel Discussion, Jack Martin - Chair – San Carlos 1**

**Operating Experience, Panel Discussion, Fred Forck - Chair – San Carlos 2**

**3:30 p.m. – 5:00 p.m.** **SOCIAL MIXER IN FERRANTES BAYVIEW ROOM**
**Monterey Marriott Hotel, 10th Floor**

## Thursday, August 30, 2007

***7:30 a.m. – 5:00 p.m.*** ***Meeting Registration*** ***San Diego***

**8:30 a.m. – 10:00 a.m.** **Technical Sessions**

**Performance Measurement Techniques, Christopher Plott – Chair, San Carlos 3**

**26 - Jaekyu Park and Yong Hee Lee:**
*An Information Requirement Analysis Based on Work Domain Analysis Techniques in Nuclear Power Plants*

**16 - Tuan Q. Tran:**
*Issues of Mitigation Strategies in Prognostic System for Next Generation Control Room*

**Root Cause, Steve Davis - Chair– San Carlos 1**

**22 - C. Robert Nelms:**
*The Problem with Root Cause Analysis*

**93 – William Corcoran, Stephen Davis and Chester Rowe:**
*Integrating Different Cause Investigation Approaches to Improve Results*

**Human Performance, John Summers, – San Carlos 2**

**108 - John Summers:**
*INPO, Assumptions and Their Influence on Errors and Events*

**Human-system Integration, Jeffrey Jones – Chair – San Carlos 4**

**33 - Francois Dionis and Dominique Pirus:**
*Ways to Improve Field Operation of NPPS Facilities by Bringing Additional Operator Aid*

**44 – Jeffrey Jones, Ruiqui Ma, Robert Starkey and Zhihua Ma:**
*Information Complexity and Appropriate Interface Design in Nuclear Power Plants Control Rooms*

***10:00 a.m. – 10:30 a.m.*** ***Morning Break***

**10:30 a.m. – 12:00 p.m.** **Technical Sessions**

**Performance Measurement Techniques, Christopher Plott, - Chair – San Carolos 3**

**15 – Tuan Q. Tran, Ronald L. Boring, Donald D. Dudenhoeffer, Bruce P. Hallbert, M. David Keller and Tessa M. Anderson:**
*Advantages and Disadvantages of Physiological Assessment for Next Generation Control Room Design*

**41 - Man Cheol Kim, Jinkyum Park and Wondea Jung:**
*Development of a Communication Database of Main Control Room Operators in Emergency Situations in Nuclear Power Plants*

## Thursday, August 30, 2007

**10:30 a.m. – 12:00 p.m.** **Technical Sessions *(Continued)***

### Human-system Integration, Jeffrey Jones – Chair – San Carlos 4

**75 - Dhong Hoon Lee, Dai IL Kim and Choong Huei Chung:**
*Regulatory Approach on Human Factors Engineering of Main Control Room Modernization: A Case of Kor-1 Nuclear Power Plant in Korea*

### Root Cause, Steve Davis - Chair – San Carlos 1

**52 – Anthony J. Spurgin:**
*Plant Upgrades in Response to Accidents: HRA Considerations*

**38 - Marnelle Sheriff:**
*Corrective Action Program and the Safety Culture*

### Human Performance, Discussion Session, Karen Jennings - Chair – San Carlos 2

**Tim Northcutt's**
*If I Could Do It Again....A New Journey to Continuous Improvement Through A Systematic Approach*

***12:00 p.m. – 1:30 p.m.*** ***Lunch Break***

**1:30 p.m. – 3:00 p.m.** **Technical Sessions**

### Human-system Integration, Belen Torralba – Chair – San Carlos 4

**62 – Anna Thunberg and Anna-Lisa Osvalder:**
*What Constitutes a Well-designed Alarm System?*

**67 – Belén Torralba, Rosario Martínez-Arias and Rosario Solá:**
*An Experimental Study of Operator Activity Using an Advanced Alarm System in Nuclear Power Plant Control Room*

**43 - Jung Taek Kim, Yoon Ki Kang, Hae Cheol Shin, Jung-Woon Lee, Sang Jung Lee and Sung Pil Lyu:**
*An Application on Alarm Root Cause Tracking System (ACTs)*

### Root Cause, Panel Discussion, Steve Davis - Chair – San Carlos 1

### Security at Nuclear Power Plants, Val Barnes – Chair – San Carlos 2

**105 - David I. Gertman, David J. Bruemmer, and R. Scott Hartley:**
*Improving Emergency Response and Human-Robotic Performance*

***Additional Discussants for this Session:***
Sue Techau – Excelon
Kristi Branch - PNNL

## Thursday, August 30, 2007

***3:00 p.m. – 3:30 p.m.*** ***Afternoon Break***

**3:30 p.m. – 5:00 p.m.** **Technical Sessions**

### HRA Requirements for PRA Panel Discussion – Anthony Spurgin – Chair – San Carlos 2

**53 – Anthony Spurgin:**
*HRA Requirements for PRAs*

### Fitness for Duty, Valerie Barnes – Chair – San Carlos 3

**05 – Candice D. Griffith and Sankaran Mahadeven:**
*The Influence of Fatigue on Human Performance: A Meta-Analysis of Sleep Deprivation Effect on Performance Measures*

**27 – Daeho Kim and YongHee Lee:**
*An Algorithm for Management of the Shift Schedule in Nuclear Power Plants with a Consideration for Human Factors*

**68 – William Nelson and Richard Green:**
*From Risk to Reality*

**81 – Marta Juahsz: - Unable to present at conference**
*Regular Assessment of Psychological Status and Psychological Health Service in NPP*

### Human-system Integration, Joe Naser – Chair – San Carlos 4

**32- Rubek Jaroslav and Janeba Břetislav:**
*Improvement of Conventional Power Plants Behavior by Qualified Maintaining of Plant Systems at Optimal Conditions by Control Systems Completed by on the Simulation Based Operator Support System*

**72 - Sven Fuchs, Kelly S. Hale, and Par Axelsson:**
*Augmented Cognition Can Increase Human Performance in the Control Room*

**34 - Dominique Galara and Dominique Pirus :**
*Finding the Way up to the Standardization of Human Machine Interface*

## Friday, August 31, 2007

**8:30 a.m. – 10:00 a.m.** **Technical Sessions**

**Knowledge Management, Richard Holman – Chair – San Carlos 4**

**03 – Jeffrey D. Brewer:**
*NAVIS-Based Knowledge Transfer from System Experts to Their Heirs Apparent*

**29 - Pia Oedewald and Teemu Reiman:**
*Measuring Conceptual Knowledge Among NPP Maintenance Personnel – A Tool for Knowledge Management*

**106 – Andrey Kosilov and Yanko Yanev:**
*Managing Nuclear Knowledge – the IAEA Approach and Activities*

**RCA & CAP, Discussion Session, Steve Davis – Chair – San Carlos 1**

**Human Performance Panel Discussion, Bruce Hallbert – Chair – San Carlos 2**

**69 - Bruce P. Hallbert, Jeffrey C. Joe, Molly J. Keefe and Julius J. Persensky:**
*Modeling and Simulation Approaches to Developing Human Performance Measures in Nuclear Industry*

***10:00 a.m. – 10:30 a.m.*** ***Morning Break***

**10:30 a.m. – 12:00 p.m.** **Technical Sessions**

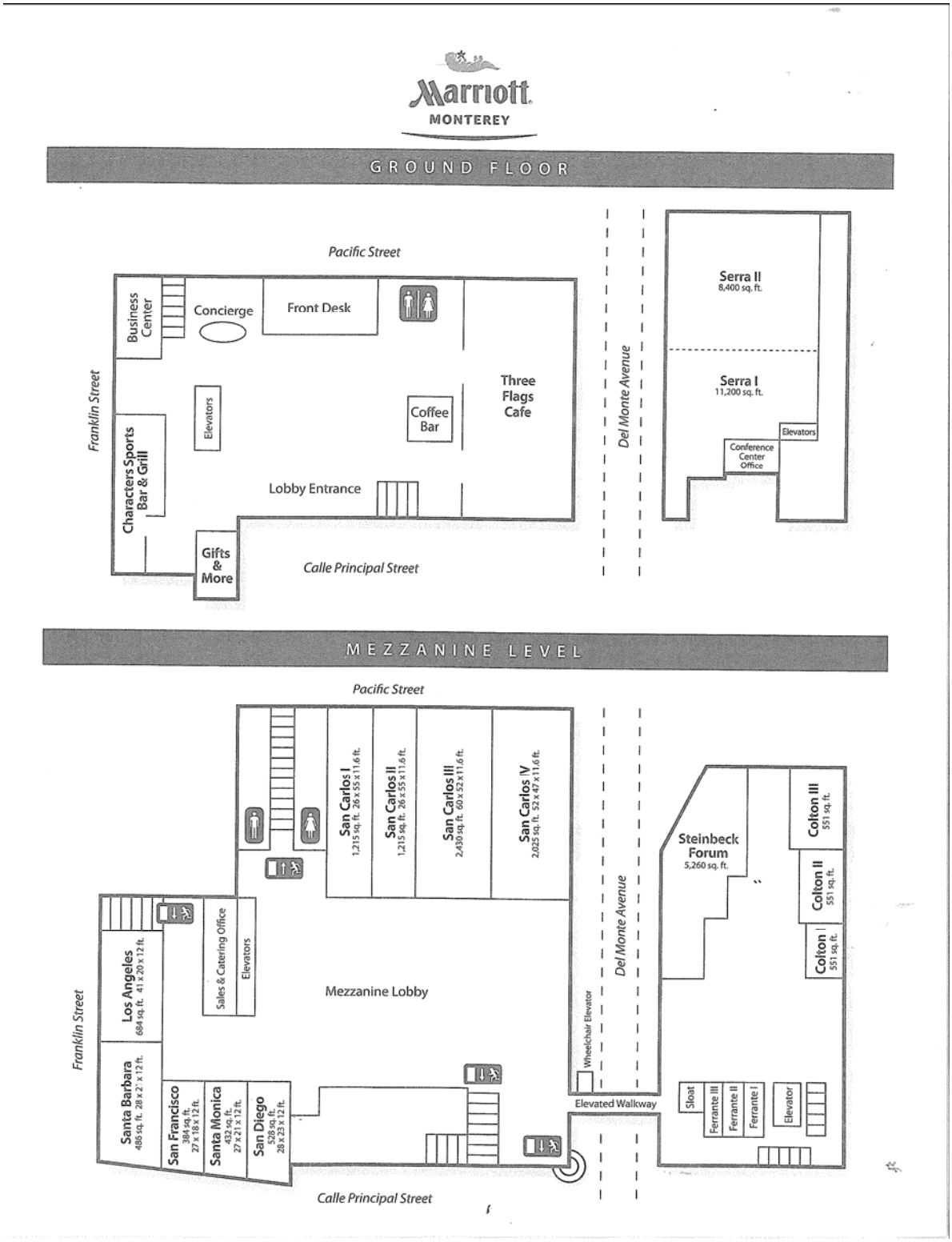
**Knowledge Management, Richard Holman – Chair – San Carlos 4**

**96 – Natividad Arrieta, Jr., Ted Leamons:**
*Knowledge Preservation*

**104 - Richard S. Hartley and Danny J. Swaim:**
*A New Causal Factor Analysis to Support a High Reliability Organization*

***12:00 p.m.*** ***Conference Adjourns***

# Hotel Conference Room Layout



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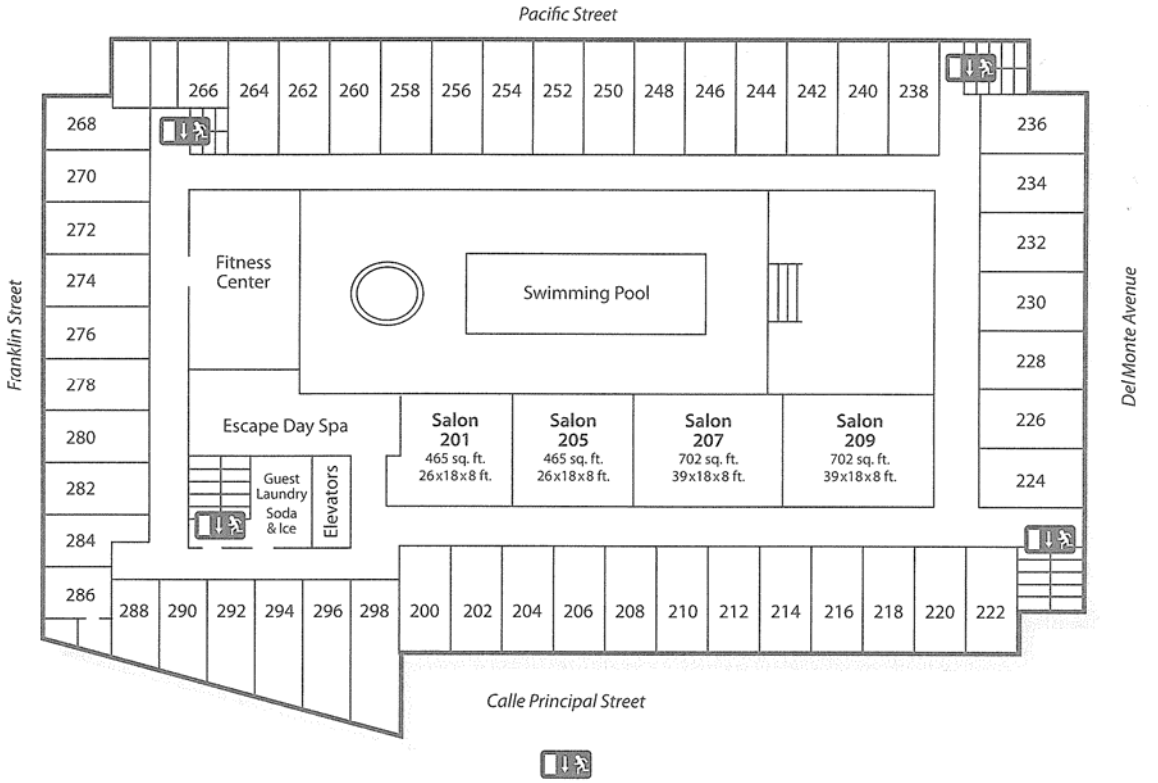
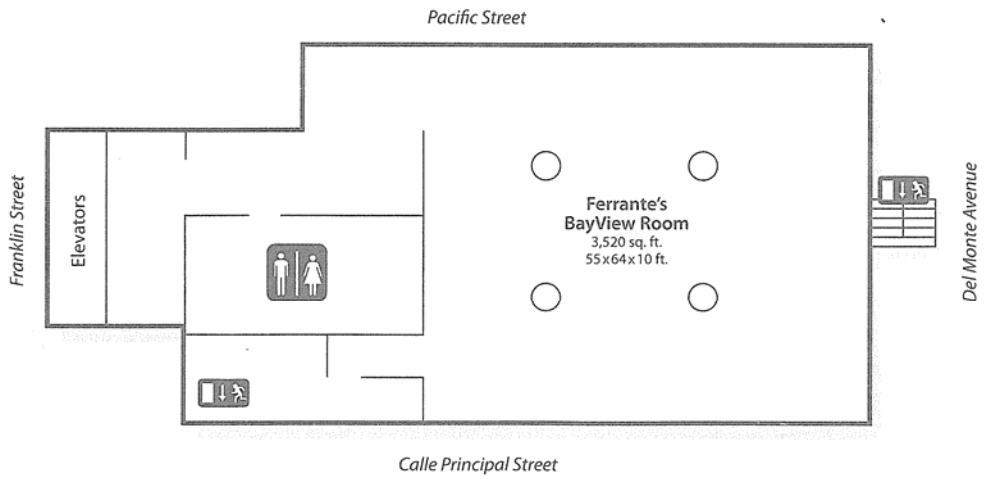
## SECOND FLOOR




**Emergency Exits:**
*Floors 2-4* located near rooms ending with: 22, 38, 66 and 82 *Floors 5-9* located near rooms ending with: 14, 70 and 82

## FERRANTE'S BAYVIEW ROOM



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