Delivering Energy Today and Tomorrow

Jeff Hedges
Division Manager, Energy Technology Company
Richmond Technology Center
August 19, 2013
# Process Safety Management Workshop Overview

## SACHE 2013 Faculty PSM Workshop
**August 18 through August 21, 2013**
Chevron Energy Technology Company, 100 Chevron Way, Conference Room 50-1125, Richmond CA

### Program Grid

**Audience:** Professors in Chemical Engineering

<table>
<thead>
<tr>
<th>Sunday, August 18</th>
<th>Monday, August 19</th>
<th>Tuesday, August 20</th>
<th>Wednesday, August 21</th>
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</thead>
<tbody>
<tr>
<td>7:30 Bus leaves hotel.</td>
<td>8:00 Continental Breakfast at Chevron</td>
<td>7:30 Leave hotel.</td>
<td>7:30 Leave hotel.</td>
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<tr>
<td>8:00 Continental Breakfast at Chevron</td>
<td>8:15 - 8:20 Announcements</td>
<td>8:00 Continental Breakfast</td>
<td>8:00 Continental Breakfast</td>
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<tr>
<td>8:15 Welcome &amp; Orientation</td>
<td>8:15 - 8:20 Announcements</td>
<td>8:15 - 8:30 Announcements</td>
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<tr>
<td>9:30-9:45 Break</td>
<td>9:30 - 9:45 Break</td>
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<td><strong>After 1 PM</strong></td>
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<tr>
<td>Faculty arrive at Hotel Courtyard Richmond Berkeley, 3150 Garrity Way, Richmond, CA 94806</td>
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</tr>
<tr>
<td>11:30 to 12:30 Lunch</td>
<td>11:30-12:15 Lunch</td>
<td>12:00 – 12:45 Working Lunch</td>
<td>12:45 – 1:30 Consequence Modeling and PSM – <em>Wilbert Lee</em></td>
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<tr>
<td>12:30 – 4:00 Presentation and Tour of Richmond Refinery <em>Heather Kulp</em></td>
<td>12:30-12:15 Lunch</td>
<td>12:45 – 1:30 Consequence Modeling and PSM – <em>Wilbert Lee</em></td>
<td>1:30 – 2:30 Continued Discussion of Integration of Materials Learned into the Classroom</td>
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<tr>
<td>4:00-4:45 Discussion of Integration of Materials Learned into the Classroom</td>
<td>1:30 – 4:00 Tour Richmond Technology Center labs. (Photographer available during this time frame)</td>
<td>4:00-4:45 Discussion of Integration of Materials Learned into the Classroom</td>
<td>1:30 – 2:30 Continued Discussion of Integration of Materials Learned into the Classroom</td>
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<tr>
<td><strong>5:00 Return to Hotel</strong></td>
<td><strong>5:00 Leave for dinner</strong></td>
<td><strong>2:30 – 3:00 Workshop Wrap Up/Assessment</strong></td>
<td><strong>3:15 Departure to airports via car pooling and taxi cab sharing?</strong></td>
</tr>
<tr>
<td><strong>6:00-7:00 Buffet at Hotel</strong></td>
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<td><strong>5:30 Dinner - Chevron Sponsored/Salute E Vita Ristorante Richmond Marina.</strong> <strong>Kory Judd</strong>, Refy General Manager delivers after dinner talk</td>
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<td><strong>7:00 – 8:00 A Welcome Icebreaker Exercise led by <em>Jeff Hedges</em></strong></td>
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<td><strong>Hotel:</strong> Courtyard Marriott</td>
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SACHE 2013 Faculty PSM Workshop

Revised 08/16/2013

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OE Moment

We start every meeting with an OE Moment
What to do in an emergency during your visit to The Richmond Technology Center:

- All RTC buildings are equipped with an emergency notification oral alarm system (public address system). Should an emergency occur, occupant notification will be made through this communication system. Facilities Operations Services (FOS) will activate strobe lights and broadcast instructions or updates via the oral alarm system as appropriate.

- To report an emergency:
  - Dial 8-777 from any facility phone (direct dial 1-510-242-8777)
  - Give your name, your location, a description of the emergency and the location of the emergency
  - Do not assume that someone else has already called
Facility Evacuation

- Business hours evacuation assembly locations:
  - Parking Lot 03 by Bldg 10
  - Parking Lot 80 inside refinery
- Bring your essential personal items to the evacuation assembly location
- Do not carry items that could cause delay or a hazardous condition
- Close – but don’t lock – your door when you leave
Shelter – In - Place

- Shelter-in-place (SIP) is an emergency procedure that isolates and shelters people in a safe haven to minimize exposure to outdoor contaminants.

- The Community Warning System siren is used to immediately notify community residents and local businesses of a potential emergency. This siren is tested monthly. No tests are scheduled during your visit.

- At RTC our emergency procedures do not call for immediate activation of SIP upon the sounding of the community siren.

- If you hear the siren please remain indoors, and wait for more information to be provided via the facility Oral Alarm System.

- A safe haven is an indoor location where air integrity can be preserved for an extended period of time. Safe haven locations are listed on the emergency information maps in each building. This room is a safe haven. Your facility and tour hosts will assist you in finding a safe haven if SIP is announced.

- When SIP is implemented, RTC will shut down supply and exhaust fans for all safe haven buildings.
We are in Earthquake Country

- When the earth shakes, wherever you are:
  - Drop, cover and hold on
  - Avoid glass and heavy objects
  - Do not run outside during shaking!

- Afterwards
  - Wait for Oral Alarm and facility announcement on next steps
Energy Is Essential
Affordable and Reliable Energy

Demand Growth 2010-2035
Quadrillion Btu

40-50% Demand Increase


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All Energy Sources Must Deliver to Meet Demand

All Energy Sources Grow – But the Mix Stays Constant
Million Barrels of Oil-Equivalent per Day

- 28% Oil
- 23% Natural Gas
- 27% Coal
- 7% Nuclear
- 15% Renewables

Source: IEA WEO 2010 Current Policies Scenario
Delivering the World’s Energy  
Safely and Reliably

4th largest international oil company

57,000 employees worldwide

2.7 million barrels of oil-equivalent production per day

Safety is our priority. In 2012, Chevron achieved its safest year ever.
Chevron
An Integrated Energy Company

Upstream
Oil and natural gas exploration and production

Midstream
Shipping and pipeline

Downstream
Manufacturing, trading and marketing of fuels, lubricants and chemicals

© 2012 Chevron
Upstream and Gas
Operating in 40 Countries Across 6 Continents

Areas of Operation

North America
Europe, Eurasia and Middle East
Africa and Latin America
Asia-Pacific
Upstream and Gas

Exploration

Development and production

Major capital projects

© 2012 Chevron
Downstream and Chemicals

Manufacturing
14 fuel refineries

Lubricants and chemicals
Techron® fuel additive

Supply and marketing
18,000 branded outlets
Scalable Renewables and Alternative Energy

Renewable geothermal energy

Non-food biofuels

Energy efficiency solutions
Technology Propels Our Growth
Protecting People and the Environment
Our #1 Priority

- Striving for an injury-free workplace
- Operating with industry-leading integrity and reliability
- Identifying and mitigating environmental and process safety risks
- Maintaining the highest standard of environmental stewardship
Partner of Choice
Being a Good Corporate Citizen

Jobs

Economic development

Community contributions
At the heart of The Chevron Way is our vision … to be *the* global energy company most admired for its:

- People
- Partnership
- Performance
The Chevron Way
Integrated Operational Excellence Values & Strategies

Operational Excellence Tenets:

• Do it safely or not at all
• There is always time to do it right

Core Value:
Protecting People and the Environment
We place the highest priority on the health and safety of our workforce and protection of our assets and the environment. We aim to be admired for world-class performance through disciplined application of our Operational Excellence Management System.

The Chevron Way is publically available in 17 languages at: http://www.chevron.com/about/operationalexcellence
“Operational discipline means completing every task, the right way, every time.”

Leadership Accountability
✓ Set Expectations
✓ Shape Behaviors
✓ Monitor Progress

Chevron’s Overview of the OEMS Document is publically available at: [http://www.chevron.com/about/operationalexcellence](http://www.chevron.com/about/operationalexcellence)
In 2012, Chevron led our peer group in personal safety, as measured by injuries requiring time away from work.

Our strong safety culture and our focused efforts in improving process safety will help us progress toward our goal of an incident-free operations.
Richmond Technology Center: 75 Plus Years of Innovation....
Richmond Technology Center (RTC)
1250 On Main Campus
People: the Most Important Part of the Equation

Energy Technology Company (~500)
Downstream & Chemicals (~500)
IT/Building Mgmt/Law (~250)
Richmond Technology Center

*...the Facilities Part of the Equation*

- 1.2 MM sq ft of office and laboratory space at RTC
- Six major buildings and 30 smaller buildings on 31 acres
- The facilities include chemical, physical and engineering laboratories; shops; office; and service areas
Richmond Technology Center
...the Facilities Part of the Equation

R&D Space - 185 Bench Scale and Larger Labs on site

**ETC**

Research & Bench Scale Units
- Distillation
- Hydroprocessing
- Reforming
- Reactor Cold Flow Models
- FCC
- Petrochemicals
- Other Specialty Applications

Analytical Sciences
- Standard Chemical and Physical Analyses
- Advanced Analytical Instruments (TEM, NMR, Mass Spec, etc.)

Rock & Reservoir Characterization

Materials Lab

Process Control/Computer Simulation Labs

**Downstream & Chemicals**

Fuels & Lubricants Blending & Testing
Catalyst Formulation Laboratory
Refinery QC Lab
Oronite Engine Test Laboratory

**CBRES**

Construction & Maintenance Shops
Questions + Answers