December 15, 2005
Prince William Sound Tug Fleet Workshop Summary

Report to:
Prince William Sound Regional Citizens' Advisory Council

PWSRCAC Contract No: 801.06.01

Prepared by:
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Oil & Gas, Environmental, Regulatory Compliance, and Training

February 23, 2006
**Introduction:**
This report provides a summary of the Prince William Sound (PWS) Tug Fleet Workshop, sponsored by Alyeska/SERVS and the PWS Tanker Owners at the Valdez Convention Center on December 15, 2005.

**Participants:**
Workshop participants included: Alyeska/SERVS, Alaska Tanker Company (ATC), ConocoPhillips Marine, SeaRiver Maritime, Polar Tankers, Crowley, United States Coast Guard (USCG), Alaska Department of Environmental Conservation (ADEC), and Prince William Sound Regional Citizens’ Advisory Council (PWSRCAC). Please see Attachment A for a complete listing of participants.

**Facilitator:**
The workshop was facilitated by Barry Romberg of ConocoPhillips Marine.

**Background:**
During 2005, the PWS Tanker Owners requested that Alyeska/SERVS conduct a study to examine the impact on the PWS Tanker Escort System by attempting to operate the system with eight (8) tugs, rather than ten (10). Data collection began in the summer of 2005 and continues through 2006. The main objective of the study was to determine if there was “fat” in the system and to determine if a smaller tug fleet would result in an unacceptable increase in risk, tanker delays, or economic impact.

By December 2005, the study concluded the number of tugs required for oil spill response is the limiting factor, not the number of tugs required to escort the tankers. While the study team found it may be possible to operate the PWS Tanker Escort System with less than ten (10) tugs for oil spill prevention, it is not possible to meet the state oil spill Response Planning Standards (RPS). The study also found that while it is possible to reduce the number of oil spill prevention tugs below ten (10) and still meet state and federal prevention obligations, reducing the tug fleet may cause delays in crude oil tanker movement at current crude oil throughput rates. The “acceptability” of delays in crude oil tanker movement is a commercial decision for the tanker owners rather than an oil spill prevention compliance issue.¹

**Workshop Goals:**
PWS Tanker Owners Tracy Coffey (SeaRiver Maritime) and Barry Romberg (ConocoPhillips Marine) clarified the workshop goals.

The workshop is intended to evaluate the number of tugs required to respond to a major tanker oil spill equivalent to the state Response Planning

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¹ For example, the cost of maintaining the extra tugs in the system vs. the cost impacts of tanker delays, high inventory, and the need for dependable oil supply to the west coast refineries.
Standard (RPS) as described in Scenario 809 of the PWS Tanker Oil Spill Discharge Prevention and Contingency Plans (PWS Tanker C-plans).

The workshop is not a request for agency approval to change the escort system at this time; this will be associated with a “long trek, including a risk assessment and disabled tanker towing study.”

**Workshop Assumptions:**
Workshop participants were asked to apply four major assumptions throughout the workshop:
1. All of the tugs in PWS are available to respond to the Scenario 809 tanker oil spill;
2. The Tanker of Opportunity (TOO) at hour 24 of the oil spill response does not require additional tugs to approach and lighten the stricken tanker;
3. The peak tug requirements for a Scenario 809 tanker oil spill occur within the first 12 hours of the oil spill response; and
4. The need to resume oil transportation simultaneous to oil spill response is ignored.

**Workshop “Compliance Test” Rules:**
According the PWS Tanker Owners interpretation of the 1995 PWS Tanker C-Plan Settlement, and currently approved plan, the following “compliance test” rules were applied throughout the workshop to determine whether or not the proposed tug configurations met state and federal compliance tests. These “compliance test” rules were not validated by the agencies, nor agreed to by PWSRCAC.
1. TransRec barges must be on-scene by hour 7.7;
2. Lightering Barge must be on-scene by hour 9; and
3. Nearshore Barge must be on-scene by hour 24.

ADEC pointed out the VMT C-plan requirement to have two tugs within two hours of Valdez, was an important compliance test which was being ignored, when tanker oil spill response operations are conducted parallel to ongoing VMT operations.

**Workshop Logistics Rules:**
The PWS Tanker Owners used the following logistics rules to compute the tug and barge deployment and transit times:
1. Tug boat speed without a barge in tow = 13 knots (kts);
2. Tug boat speed with a barge in tow = 10 kts;
3. One-hour setup time for manned barges, and 1.5 hours for unmanned barges; and
4. One-hour barge deployment time.

PWSRCAC questioned the use of the same tug speed assumptions in all seasons and all weather conditions.

**Agency & PWSRCAC Concerns About Assumptions and Rules**
Both ADEC and PWSRCAC participants repeatedly expressed concern about the proposed workshop assumptions and rules. PWSRCAC also requested an opportunity to verify the 1995 settlement terms and conditions to verify the “compliance test” assumptions. Both PWSRCAC and the agencies were
concerned that too many important compliance obligations were being excluded from the analysis for the workshop to develop any solid recommendations for the minimum number of tugs required in PWS. Participants agreed that future workshops, meetings and studies would be needed to address the excluded issues.

Key concerns raised by participants included:

- Docking tug requirements to meet VMT C-plan compliance requirements;
- Tugs needed to escort out laden tankers simultaneous to the oil spill response effort;\(^2\)
- The need to evaluate the type and capability of each tug when making tug assignments in an oil spill response, to ensure that the use of each tug is optimized for its intended purpose;\(^3\)
- Use of optimistic one-hour setup and one-hour deployment times and barge speed times during winter operating and storm conditions; and
- The need to fully examine the entire 72 hr-RPS period to verify compliance, rather than limiting the examination to just hours 0-12 of the RPS period.

PWSRCAC concluded the workshop assumptions excluded some of the biggest “hurdles in the system” which may impact the tug requirement count by several tugs (2-4), whereas the remaining tug issues left for the workshop may only result in a 1-2 tug count deviation.

PWSRCAC pointed out that in the PWS Tanker C-plan revision from 12 to 10 tugs, there was considerable “belt tightening” in the tug planning assumptions. PWSRCAC recommended the workgroup go back and revisit the assumption changes which resulted in ADEC’s approval to reduce the total number of tugs in PWS to ten (10), as Best Available Technology.

All participants agreed to move forward and conduct the workshop under these proposed assumptions; however, it was agreed that future workshops would be needed to address the remaining assumptions before any formal reduction in tug escort requirements is proposed.

**ADEC Clarifications:**
ADEC provided three important clarifications and interpretations at the workshop:

1. Bill Hutmacher confirmed two tugs would need to remain with the stricken tanker. He emphasized it was not realistic, or safe, to assume a tug could be removed from a stricken tanker for the purposes of retrieving an oil spill response barge. He said this would never be approved by the state and based on his experience

\(^2\) due to the political and economic momentum which will require rapid resumption of oil transportation through PWS simultaneous to the oil spill response effort.

\(^3\) For example, ETTs and PRTs are much more effective at staying in the oil slick for recovery operations then a conventional tug.
as the USCG Valdez Captain of the Port, he did not believe the USCG would ever approve of such action.

2. Bill Hutmacher clarified the tug fleet must be based on the number of tugs required to comply with the PWS Tanker C-plan and VMT C-plan oil spill prevention and response requirements, without any waivers assumed. He confirmed that a C-plan holder can not plan for a waiver to meet the state Response Planning Standard or oil spill prevention requirements.

3. John Kotula clarified that a Tanker of Opportunity (TOO) would require tug support to safely bring the vessel alongside a stricken tanker and lighter oil.

**PWSRCAC’s Hinchinbrook Concern:**
PWSRCAC pointed out that the PWS Tanker C-plan requires the Hinchinbrook tug to be either an Enhanced Tractor Tug (ETT) or Prevention and Response Tug (PRT) and allows limited and temporary use of a Theriot Class tug when the ETTs or PRTs are undergoing maintenance. PWSRCAC expressed concern that the Theriot Class tug (Sea Voyager) was being used more frequently than allowed by the c-plan, and requested that Alyeska/SERVS review this situation and ensure that the Theriot Class tug use is restricted in compliance with the c-plan.

**Alyeska/SERVS Carpet Top Exercise**
Alyeska/SERVS personnel conducted a “Carpet Top” Exercise at the workshop which consisted of a simplistic map of PWS outlined on the carpet and use of model tugs, tankers and barges to focus the workshop participant discussion on the number of tugs required for various oil spill response and oil transportation scenarios. To maximize participant understanding of the tugs required for each scenario, the model tugs, tankers and barges were moved into position on the carpet.

Using the assumptions established earlier in the workshop, Barry Romberg estimated the time it would take for each tug to meet the 1995 PWS Tanker C-plan Settlement Agreement oil spill RPS timeframes. The Carpet Top Exercise tested a 300,000 barrel oil spill from a crude oil tanker at Seal Rocks, as described in Scenario 809 of the PWS Tanker C-plan. Bruce Painter (SERVS) captured the results of each carpet top scenario analysis on a spreadsheet.4

**Tug Escort and Docking Tug Requirements**
Alyeska started the Carpet Top Exercise by confirming that the current tug escort system is designed to handle two laden tankers in PWS, using a sentinel escort system. The Carpet Top Exercise confirmed that an absolute minimum of 8-9 tugs is required to meet the tug escort requirements and docking tug

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4 PWSRCAC had intended to attach Bruce’s spreadsheet analysis and the facilitator’s workshop report as an Appendix to this report for documentation purposes; however, they were not completed at the time this report was issued.
requirements. Please see Table 1 for a detailed list of tug spill prevention duties. Alyeska/SERVS said the 2005 study showed if they carefully space the outbound laden tankers by at least 5 hours, a minimum number of 8 tugs for summer escort.

Participants asked about the frequency of inbound laden tankers and asked how an 8-9 minimum tug system would handle a third laden tanker in the system. Alyeska confirmed inbound laden tankers occurred about once a month, and the system would be “stressed” with a third laden tanker in the system. Alyeska said most-likely the third tanker would need to wait, since the tug escort system is only designed to handle two laden tankers in the system at a time. Therefore, it was concluded that dropping the minimum tugs to eight (8) would require very careful scheduling of tankers, otherwise considerable delays and increased operating costs would be incurred.

<table>
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<tr>
<th>Tug Requirement</th>
<th>Function</th>
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<tbody>
<tr>
<td>+1</td>
<td>Support Barge 450-1 at Port Etches</td>
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<tr>
<td>+1</td>
<td>Support Barge 450-3 at Naked Island</td>
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<tr>
<td>+1</td>
<td>Hinchinbrook Tug</td>
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<tr>
<td>+3</td>
<td>Sentinel Tug Escort System for Two Laden Tankers</td>
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<tr>
<td>+2</td>
<td>VMT Docking Tug within 2 hrs of Valdez (small tanker)</td>
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<tr>
<td>+1</td>
<td>VMT Docking Tug within 2 hrs of Valdez (large tanker &gt;150,000 DWT)</td>
</tr>
<tr>
<td>8-9</td>
<td>Total Oil Spill Prevention Requirements</td>
</tr>
</tbody>
</table>

The oil spill prevention analysis confirmed that oil spill prevention requirements were not the limiting factor in determining the minimum PWS Tug Fleet. The critical factor was the number of tugs required to meet the PWS Tanker C-plan RPS.

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5 As stated by the PWS Tanker Owners at the workshop, the Tanker Escort System is designed to handle two laden tankers in the system. While on occasion there may only be one laden tanker in the system at a time, the tug fleet can not be designed for the occasional tanker escort pattern, it must be designed for the intended system which is two laden tankers. Furthermore, at current oil transportation throughput rates, if one laden tanker is exiting PWS, another tanker will either be coming into port and require docking tugs at the port or will be preparing to exit the port and will require tugs to exit the system. Docking tug requirements can reach a total of three (3) tugs if a 150,000 DWT or larger tug is in the system. Thus, the system must plan for at least five (5) tugs to escort and/or dock the tankers.

6 Condition 8 of the Amended 2001 PWS Tanker C-plan approval allows the Port Etches Barge to move to Naked Island during the winter; however, the two tugs must stay with the two barges at Naked Island during the winter.
Oil Spill Response Tug Requirements

Several different oil spill response scenarios were examined via the Carpet Top Exercise including: seasonal evaluations (winter vs. summer) and differences between one and two laden tankers in the system at the time of the spill.

**Summer Tug Configuration- Two Laden Tankers – Second Tanker Escorted out of PWS**

Alyeska made a case for a minimum number of eight (8) oil spill response tugs in the summer, with two laden tankers in the system. To meet this minimum eight (8) tug goal the following assumptions must be made:

- Two tugs stay with the stricken tanker;
- The second laden tanker is escorted out of PWS, past the oil spill at Seal Rocks, either through the oil spill or around it, and the tugs are then released in enough time to go back to Port Valdez and retrieve the oil spill response barges. Therefore, only 6 tugs are needed to support the 6 oil spill response barges.

*Note: In the case examined at the Carpet Top Exercise it took the tug 8.9 hrs to get Barge 570 to the spill location, which is under the 9 hr compliance time, but less than a 1% margin for error.*

- No tugs are required to bring the TOO alongside the stricken tanker during the first 72 hours;7
- The terminal is completely shutdown (otherwise an additional 2-3 docking tugs are required);8
- No inbound laden tankers are being escorted; and
- No dispersant application processes simultaneous to mechanical response taxing the ETT availability.

**Winter Tug Configuration- Two Laden Tankers – Anchor Second Tanker at Knowles Head**

Alyeska made a case for a minimum number of ten (10) oil spill response tugs in the winter, with two laden tankers in the system. To meet this minimum ten tug goal the following assumptions must be made:

- Two (2) tugs stay with the stricken tanker;
- Two (2) escort the second laden tanker to Knowles Head and remain with it at anchor;
- Six (6) tugs support the six (6) oil spill response barges;

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7 Safe marine operations would require tugs to bring a TOO alongside of a stricken tanker for safe and effective lightering operations.
8 The VMT C-plan requires two docking tugs for all tankers, and an additional tug for tankers 150,000 DWT and larger.
• No tugs are required to bring the TOO alongside the stricken tanker during the first 72 hours;
• The terminal is completely shutdown (otherwise an additional 2-3 docking tugs are required);
• No inbound laden tankers are being escorted; and
• No dispersant application processes simultaneous to mechanical response taxing the ETT availability.

**Summer Tug Configuration - Two Laden Tankers – Anchor Second Tanker at Knowles Head**
Alyeska made a case for a minimum number of ten (10) oil spill response tugs in the summer. This case included: two laden tankers in the system and the second tanker was anchored at Knowles Head in the event of a spill similar to the winter scenario described above.

**Summer Tug Configuration - One Laden Tanker – Anchor Second Tanker at Knowles Head**
Alyeska made a case for a minimum number of eight (8) oil spill response tugs in the summer, with only one laden tanker in the system. To meet this minimum eight tug goal the following assumptions must be made:

  o Two (2) tugs stay with the stricken tanker;
  o Six (6) tugs support the six (6) oil spill response barges;
  
  *Note: In the case examined at the carpet top it took the tug 7.7 hours to get Barge 570 to the spill location, which is under the 9 hour compliance time, but less than a 15% margin for error.*
  o No tugs are required to bring the TOO along side the stricken tanker during the first 72 hours;
  o The terminal is completely shutdown (otherwise an additional 2-3 docking tugs are required);
  o No other inbound or outbound laden tankers are being escorted; and
  o No dispersant application processes simultaneous to mechanical response taxing the ETT availability.

**PWSRCAC Summary of Tug Fleet Considerations**
The workshop clearly demonstrated that the minimum number of tugs which must be maintained in the PWS Tug Fleet is driven by the number of tugs required to meet the PWS Tanker C-plan RPS sized oil spill and also meet VMT C-plan compliance obligations. A summary of the tug requirements to meet these obligations is presented in Table No. 2 below.
Table No. 2
Two (2) Tankers in PWS
During a Tanker RPS Sized Oil Spill

1st Tanker – Stricken

2nd Tanker – Laden Exiting PWS

OR

2nd Tanker – Docking at VMT
(Docking Operations would have to be limited to the bare minimum of two docking tugs)

Tugs to Support Response Barges

Once the 2nd tanker is escorted out of the system or the tanker near the dock is docked or un-docked the two available tugs would be assigned to support the Tanker of Opportunity9

Ten (10) Total Tugs

During normal operations, with ten (10) tugs there are a sufficient number of tugs to meet the barge support requirements at Port Etches, Naked Island and Hinchinbrook Entrance, dock the tankers at the VMT, and employ the sentinel escort system to escort two laden tankers out of the PWS (see Table No.1). However, during an oil spill the number of tugs required to support the barges increases from three (3) to six (6). If the number of tugs is dropped below ten (10) total tugs, there would not be a sufficient number of tugs in the system to provide support to all six (6) barges, have two (2) tugs remain

9 In winter weather conditions it may not be possible to safely escort the second laden tanker out of PWS simultaneous to a major tanker oil spill response. If the second tanker can not be escorted out of PWS, the two tugs escorting that tanker can not be released to support oil spill response barges and meet the response times required by the 1995 PWS Tanker Settlement. It is more likely that, in winter conditions, the second laden tanker would be taken to Knowles Head. The tugs would remain with the tanker at anchor until the spill response was well underway and it was safe to escort the tanker out of PWS.
with the stricken tanker, escort the second laden tanker out of the system or provide docking tug assistance. It is clear that a ten (10) tug system is only designed to have two tankers in the system at any one time, not just two laden tankers, since in the event of an oil spill it would not be possible to meet both the PWS Tanker C-plan tug fleet response requirements and the PWS VMT C-plan tug fleet prevention requirements simultaneously. The only way a ten (10) tug system works is to be limited to two tankers at one time. Therefore, if the second tanker is at dock, then it only requires docking tugs, and if the second tanker is laden and is exiting PWS, it only requires escort tugs. A third tanker in the system (either laden or at dock) stresses the system beyond a ten (10) tug capacity if an RPS incident were to occur. A third tanker in the system would stress the system past ten (10) tugs.

As shown in Table No. 3 below, a third tanker in the system would stress the system past ten (10) tugs.

<table>
<thead>
<tr>
<th>Table No. 3</th>
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<tbody>
<tr>
<td>Three (3) Tankers in PWS</td>
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<tr>
<td>During an Tanker RPS Sized Oil Spill</td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; Tanker - Stricken</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; Tanker – Laden Exiting PWS</td>
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<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; Tanker – Docking at VMT</td>
</tr>
<tr>
<td>Docking Operations would be limited to the Bare Minimum of Two Docking Tugs</td>
</tr>
<tr>
<td>Tugs to Support Response Barges</td>
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</tbody>
</table>
| Once the 2<sup>nd</sup> tanker is escorted out of the system or the tanker near the dock is docked or un-
  docked the two available tugs would be assigned to support the Tanker of Opportunity |
| Thirteen (13) Total Tugs                                                  |
As shown in Table 4, the addition of dispersant application responsibilities to the response system would further stress the number of available tugs. The current PWS Tanker C-plan envisions two of the Enhanced Tractor Tugs (ETTs) being diverted to the job of dispersant application early in the oil spill (within the 72 hour response planning standard period). The current number of tugs in the system (10 tugs) is not equipped to handle three tankers in the system and apply dispersants simultaneous to a mechanical oil spill response. Thus, PWSRCAC concludes the current ten (10) tug system is only designed to handle two tankers in the system and deploy a mechanical response action to a RPS sized PWS tanker oil spill in PWS.

Table No. 4

Three (3) Tankers in PWS During an Tanker RPS Sized Oil Spill & Dispersant Application

<table>
<thead>
<tr>
<th>Tanker</th>
<th>Details</th>
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<tbody>
<tr>
<td>1st Tanker</td>
<td>Stricken</td>
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<tr>
<td>2nd Tanker</td>
<td>Laden Exiting PWS</td>
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<tr>
<td>3rd Tanker</td>
<td>Docking at VMT</td>
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</table>

Tugs to Support Response Barges

*Once the 2nd tanker is escorted out of the system or the tanker near the dock is docked or undocked the two available tugs would be assigned to support the Tanker of Opportunity*

Two (2) ETTs would be diverted to dispersant application**10**

Fifteen (15) Total Tugs

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**10** The issue of tug needs for dispersant application was not raised at the workshop; however, this potential additional tug requirement is added to the tug fleet needs list for completeness. PWSRCAC observes that dispersant application decisions must be made early in the spill (according to NRC 2005 Study within 12-48 hours); therefore there will be competition for tug resources between dispersant application and mechanical response requiring an increase in tug requirements to conduct simultaneous operations.
Key Workshop Findings:

1. Oil spill response requirements are the limiting factor in determining the minimum size of the PWS Tug Fleet, not oil spill prevention requirements (tug escorts and docking tugs).

2. The ten (10) tug fleet system is only designed to meet the prevention requirements of two tankers simultaneous to a full RPS response.

3. The minimum PWS Tug Fleet size must be determined independent of any future, potential waiver which may be received from Unified Command during an actual oil spill response.

4. The minimum PWS Tug Fleet size must include VMT C-Plan tug requirements.

5. Laden tankers can not be left at Knowles Head or other anchorage without escort tugs.\footnote{This would require a waiver.}

6. The Unified Command would not allow tugs to leave a stricken tanker to retrieve an oil spill response barge.

7. The eight (8) tug case was conditioned with so many caveats that it was not realistic.

8. An eight (8) tug case can not be achieved in year round operating conditions.

9. There is less than 1% margin of error for meeting the Barge 570 response time in the summer eight (8) tug case, with two laden tankers in the system.

10. The eight (8) tug cases do not address the very likely need to escort laden tankers simultaneous to the oil spill response effort.

11. The type and capability of each tug was not considered when making tug assignments to ensure that the use of each tug is optimized for its intended purpose. For example, a PRT or ETT must be used as the Hinchinbrook tug.

12. One-hour setup and one-hour deployment times during winter operating and storm conditions needs to be validated via field deployment exercises.

13. The entire 72 hr-RPS period must be used to verify compliance, rather than limiting the examination to just hours 0-12 of the RPS period.

14. An evaluation of the entire oil transportation system, from the North Slope to the Valdez Marine Terminal, through PWS, and to its ultimate destination at the refineries, is needed to determine the complete tug requirements.

15. Tug requirements must consider Tanker of Opportunity (TOO) requirements.

16. Tug and tanker speed assumptions during winter operating and storm conditions need to be validated via field deployment exercises.
17. The impact of human factors on the tug fleet requirements needs to be considered.

18. Safety issues must be considered. Is it safe to have only one tug per barge in winter conditions in certain areas of PWS?

19. Risk issues must be considered. Is it acceptable to increase risk by decreasing system redundancy?

20. National security issues must be considered. Will national security require transportation of oil simultaneous to oil spill response actions triggering incremental tug requirements? What are national consequences of west coast refineries running out of oil supply?
## Participants List

<table>
<thead>
<tr>
<th>Name</th>
<th>Organization</th>
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<tbody>
<tr>
<td>Kris O’Connor</td>
<td>ConocoPhillips</td>
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<td>Crowley</td>
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<td>APSC/SERVVS</td>
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<td>Tracy Coffey</td>
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<td>Rhonda Williams</td>
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<td>Susan Harvey</td>
<td>PWSRCAC (Consultant)</td>
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<td>Stan Stephens</td>
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<td>R.T. Blanchard</td>
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<td>Don Dickenson</td>
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<td>Geoff Merrell</td>
<td>Alyeska, VMT</td>
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<td>Curtis Wright</td>
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