



Shell Alaska Lessons Learned and Changes Implemented Post 2012

Shell drilled in the Alaskan Arctic for the first time in 20 years during the open water season of 2012. Many operational elements of the program were executed well, however there were significant events that occurred during the season, which resulted in reviews being conducted and written reports being issued by the Department of the Interior (DOI) and the U.S. Coast Guard (USCG). Shell also engaged in its own review of the 2012 season to identify areas where operational performance could be improved. The improvements made by Shell and its contractors, highlighted below, address the issues identified both by the government and Shell following 2012, while reinforcing the effective and successful aspects of operations conducted during that season.

Looking forward, Shell is committed to operating exceptionally well in Alaska's Arctic environment.

Overview

- Shell has put in place a larger, more senior team with a strong asset base to build capacity for future operations offshore Alaska. Shell has restructured the team charged with exploring Alaska opportunities accordingly. The implementation of an Alaska-focused management structure allows Shell to draw from and integrate global and regional Shell expertise in support of Alaska operations.
- In accordance with one of the two main recommendations made in the DOI Report, Shell developed a comprehensive "2014 Integrated Operations Plan (IOP) for the Chukchi Sea" and submitted it to the BOEM on November 26, 2013. The IOP served as a summary document that described all aspects of Shell's then-planned continuation of Chukchi Sea drilling activities in 2014. The IOP addressed issues cited in the 2013 DOI report and described organizational and operational improvements for the next phase of exploratory operations. The DOI noted that the level of detail in the 2014 IOP met the intent of the DOI recommendation.
- To address the DOI's second recommendation, Shell commissioned an Independent Third Party Management System Audit from Bureau Veritas, which indicated, based on the first phase conducted, that Shell's management system was in conformance with all seventeen elements of the safety and environmental management systems used by federal regulators to enhance the safety of offshore operations. Moreover, the audit findings indicated that matters identified as shortcomings by the DOI Report have been addressed and that Shell's management systems are appropriately tailored to its Alaska Exploration Program, based on direct observations, interviews and records sampled. The audit also validated the 2014 IOP as "comprehensive and exceptionally well-prepared."
- When Shell has mobilized operating assets for a continuation of the exploratory campaign, auditors will conduct a field stage audit.

Improved Contractor Management

The DOI Report stated that "[t]he most significant shortcomings in Shell's management systems were in the area of contractor management and oversight." The Coast Guard *Kulluk* investigation also found that contractor issues contributed to the marine casualty. Since 2012, Shell has put in place an Alaska Contract Management Framework, setting forth more clearly stated requirements for contracts and contractor management in the Alaskan Arctic. The framework:

- Limits the number of contracts individual Shell contract holders may manage;
- Establishes the roles of contract management team members who collectively manage each Shell contract, increasing accountability and oversight; and



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- Requires contract management plans for large (level of risk and value) contracts, adding an additional degree of oversight and scrutiny to high level contractors.

Contractor Improvements

The contractor community working with Shell in Alaska has also taken steps to incorporate learnings from the 2012 season in an effort to improve operating performance.

- Noble and Shell have invested approximately \$200 million in upgrades to the *Discoverer* since 2010. In addition, Noble implemented fleet-wide mandatory training to enhance overall crew training and competence, specific to MARPOL compliance and the operation and record-keeping requirements of pollution prevention equipment.
- Edison Chouest Offshore (ECO) has increased the seniority of their personnel in Anchorage. Additionally, the frequency of interactions between ECO and the Shell Alaska contractor management team has increased by more than 100 percent in an effort to ensure seamless interaction between the two companies.
- Since 2012, Harvey Gulf has restructured their Quality, Health, Safety, Security and Environment (HSSE) department. An indication of the change in operational safety culture at Harvey Gulf has been their HSSE presentations at numerous public maritime forums – they have become teachers in how a positive change of safety culture can improve operational effectiveness.
- Superior Energy Services-Marine Technical Services (SES-MTS) was created after the 2012 season to better manage the Arctic Containment System (ACS). SES-MTS has embarked on a program to employ strategic partners to bolster performance.

Asset Upgrades

Substantial improvements have been made to the assets supporting Shell's Alaska program since 2012.

- The *Kulluk* has been replaced by the Transocean *Polar Pioneer*, a harsh weather semi-submersible rig that has been operating in Norway prior to coming on contract to Shell. The rig is undergoing extensive planned maintenance and upgrades, including environmental improvements, the addition of a second Blowout Preventer, installation of an ice radar system, renewal of class certification, and upgrading the hull to enable transit through limited ice conditions.
- The Noble *Discoverer* has been upgraded extensively to address the specific findings of the 2012 Port State Detention and to improve drilling performance.
- Modifications and subsequent sea trials have been conducted on the *Aiviq* (towing vessel).
- Additional ships have been contracted to provide redundancy in operational support.
- An additional helicopter will be contracted to support aviation activities. Helicopters used for crew changes have been equipped with rotor icing protection systems, extending flight capabilities during the season.
- Improvements have been made to source containment/emergency response assets and additional equipment has been purchased to ensure redundancy based on the lessons learned in 2012.
- Maintenance and inventory of critical spare parts for the oil spill response equipment have been enhanced by utilizing a top class maintenance and storage facility in Anchorage.
- The ACS has been modified and was successfully tested in 2013 under the observation of the BSEE. The ACS support barge has received its class certificate from the American Bureau of Shipping and has passed USCG inspections.



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Utilizing Shell's Marine Expertise

The DOI Report attributed the 2012 ACS delays, Noble Discoverer deficiencies, and the *Kulluk* grounding in part to "Shell not employing its internal marine expertise in these situations." The Coast Guard *Kulluk* investigation also cited a "specific lack of experience" among the towing vessel crew for operations in the Gulf of Alaska in winter. Since 2012, Shell has worked to ensure that its existing marine expertise is applied to future Alaska operations and to improve oversight to ensure that contractors operating in Alaskan Arctic waters on Shell's behalf are trained and prepared to work in Arctic conditions.

- Enhanced towing procedures and assurance processes are in place, based on lessons learned from Shell's experience with the *Kulluk*, and correlating asset upgrades have increased the capability of tug vessels.
- Licensed mariners will be deployed on Shell's drilling units in future drilling seasons.
- Each vessel will have a detailed crew matrix to verify that the right experience and competencies necessary to deliver the vessel's mission in the Alaskan Arctic are represented.
- Introduction of maritime HSSE capability reviews by Shell's maritime contractors. This gives Shell greater insight to the contractor's safety management systems, based on the industry proven offshore vessels management self-assessment process.
- Critical vessel operations have been reviewed and checklists developed to bolster performance. Operations are witnessed by mariners to measure compliance and provide corrective feedback where required, e.g. vessel-to-vessel personnel transfers.

Implementation of Arctic-Specific HSSE Elements, Policies and Procedures

The DOI report stated: "It was also not clear the extent to which Shell tailored its global HSE elements to the 2012 Alaska offshore operations. . . .The Shell Contractor Health, Safety, and Environmental Handbook also appeared to originate from the global Shell corporate level, without specific adaptations for applicability in the Arctic."

- Shell's revised Alaska Management System (AMS) is now in place and focuses management on Arctic-specific HSSE risks and strengthens requirements necessary and unique to the Alaskan Arctic.
- Arctic-specific controls and procedures have been enhanced, including but not limited to: emergency plans, vessel to vessel transfer, cold climate work procedures and journey management.
- Shell's renewed focus on Arctic-specific policies and procedures was reflected in the 2014 IOP, which makes multiple references to adaptations for Arctic operations, most notably in its extensive description of Shell's training requirements for personnel travelling to, and working in Arctic conditions. The Alaska project training plan requires training on cultural and environmental awareness, environmental and permit compliance for field leadership, cold water survival, cold weather gear, winter defensive driving, waste disposal, and Arctic-specific training in each work area (i.e., drilling, aviation, maritime), among other more general training subjects. This training is required for both Shell and contractor employees, and is tracked for all personnel.

Integrated Risk Management

The DOI Report noted a lack of "clear evidence that Shell applied an integrated risk management approach" in 2012, other than the elements required as part of SEMS. Since 2012 Shell has implemented a new integrated risk management process that ensures technical and non-technical risks are identified, communicated to management, and mitigated.



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- As part of the assurance program supporting the Alaska Management System, the Risk and Assurance team addresses compliance with Shell's broader HSSE and SP control frameworks, regulatory compliance, marine and aviation business processes, as well as key readiness activities supporting the decision to commit to an Alaska operating season.
- Accountability is established for all risks through the assignment of risk owners.
- Specific to marine operations and assurance, a dedicated Alaska Maritime Assurance Manager manages marine assurance, while the Alaska Marine Manager supports marine operations, providing a check and balance between operations and assurance.

Enhanced Operational Planning

The DOI Report stated, "Shell consistently underestimated the length of time required to complete each step of its drilling operations," and accordingly, "the timeline provided by Shell proved to be unrealistic and did not account for complications and delays that should be budgeted for when operating in the Arctic." Shell has improved its integrated activity planning (IAP) process to reflect the long lead times and short operating season unique to Arctic operations.

The IAP encompasses all phases of a single drilling season, including preparation, mobilization, execution, and demobilization. The IAP consists of a detailed schedule, incorporating an approved baseline that will be used as the control and progress management schedule forecasting tool. Additional documentation is provided from the risk management and change management processes to complete the overall IAP. Shell's IAP team has been expanded, and provides planning support to Wells and Logistics as they develop detailed functional plans for each season. Execution support has been supplemented with positions tasked with providing readiness assurance to Operations management, and performance monitoring of delivery against the IAP.

Operational Readiness and Assurance

- In 2014 the Alaska operations team simulated operational activities to familiarize the new organization with the Alaska Arctic environment and reviewed information flows and decision requirements under the revised AMS. An extensive exercise titled *A Week in the Life* was performed in November 2014; this exercise involved all the teams supporting operations in Alaska. Shell Alaska staff drilled the scenarios over the course of a week, including the deployment of field personnel. During the exercise, operational communications and decision making processes were tested and evaluated. The lessons learned are being evaluated, and will be incorporated in the operational procedures ahead of the next operating season.
- Since 2012, Shell has continued to conduct annual oil spill response exercises to train the crews that will mobilize for future operating seasons, maintain compliance with regulatory requirements, and confirm that Shell's new organization is trained and familiar with the Oil Spill Response Plan and the Incident Command System.
- Shell will conduct a comprehensive oil spill response training and deployment program in Valdez during the spring of 2015 as part of its preparation for future operations.
- In parallel with these operational drills, Shell will conduct a series of assurance reviews, assessing compliance with Shell's requirements and the readiness of all elements of the Alaska operating program before determining whether to proceed with operations.