The development of an **INTEGRATED OIL HERDER APPLICATOR AND IGNITER LAUNCHING SYSTEM** for use from a helicopter

**CONCLUSION**

Herders and remote ignition devices offer great promise for spill response in remote areas where access by helicopter may be the only available tool. Fast response times, even faster disposal by fire, and small quantities of residue after a prompt and effective burn offer significant reductions in environmental damage caused by mechanical response techniques.

**INTRODUCTION**

The Oil Herder System is an integrated system of sprayer, launcher, igniter, and data logging, developed in partnership, by DESMI Ro-Clean, SL Ross Environmental Research Ltd. (SLR), ExxonMobil Upstream Research Company (URC), and International Oil and Gas Producers Assoc./Joint Industry Project (IOGP/JIP).

**OBJECTIVES**

The goal of the various Herder Systems is to be able to have a commercially available herder to combat in-situ burning within remote locations where conventional response equipment is not environmentally, or economically feasible - i.e. harsh, broken ice conditions or swamps and open prairies.

In 2014, two herders, the OP-40 and ThickSlick 6535, were successfully tested and subsequently, on the USEPA’s list of accepted chemicals for use for oil spill response. Simultaneously, DESMI Ro-Clean developed a helicopter born system for applying herders and began testing at Texas A&M. The experiments were to test the effects of slipstream and rotor wash on the spray nozzles, as well as, the ability to deploy a spray nozzle at the end of a 30-60 meter long hose. The concluding result was a re-design of the system to fit into a Bell model 407 helicopter, which was the helicopter identified for the test program planned by the IOGP/JIP at Poker Flats Alaska. This particular program demonstrated that we can spray chemical from an aircraft with enough accuracy to herd the slick and return to ignite it with the Simplex Helitorch system.

**METHOD**

The integration of spray, herder launch, and ignition process onto aircraft has improved response time and efficiency of a burn program.

The system also uses an underslung launcher system – holding up to 15 igniters – that is fully self-contained. The launcher has a wide angle TV – with low light or IR – and GPS positioning for tracking, along with a temperature sensors inside the launcher in the event the igniter auto-ignites.

In operation, the tank, pump, and reel system is securely placed inside the helicopter, with the reel system, hose and integral load cable supporting the launcher. 60 meters of hose/cable ensures adequate distance between the helicopter and surface of the water so the rotor wash will not degrade the performance of the herder. The pilot is able to see the launcher below the vehicle.

The Herder chemical works rather quickly, and dosage rates are very low, on the order of 4-5 litres per km of slick perimeter. The igniter can be deposited on the slick from heights of 15-20 feet. There is a built in two minute delay into the timer circuit to enable the splash zone to re-coalesce. Slicks of 3-4 mm thick ignite readily when fresh crude is present, and flames spread vigorously. Burn efficiencies of 80-90% have been witnessed in mesoscale testing of quantities of five gallons to five cubic meters.

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**RESULTS**

The Poker Flats experience raised a number of questions regarding spraying and ignition that needed to be addressed.

Concerns raised during the testing include:
- Safety of the aircraft spraying from the end of a long hose with potential ground contact.
- Accurate removal of an igniter.
- Safety and lifetime aspects of an igniter that would need to be shipped, stored, and carried either aboard or underslung from a helicopter.
- What ignition capability was required to ignite a herded slick in the first place?
- How long did the igniter have to burn for consistent successful ignition of the slick?
- How do we keep track of placement of the igniters?

Testing indicates:
- The igniters work successfully under a variety of test conditions
- Production versions work successfully and storage life of the system is not contingent on the components. Operational controls are wireless and simple for operator use.
- Operational safety has also been well thought out, with heat sensors inside the launcher, and a pilot operated jettison system consisting of a cable cutter will enable the launcher to be instantly released in the event of ground entanglement.

**CONCLUSION**

Herders and remote ignition devices offer great promise for spill response in remote areas where access by helicopter may be the only available tool. Fast response times, even faster disposal by fire, and small quantities of residue after a prompt and effective burn offer significant reductions in environmental damage caused by mechanical response techniques.

**REFERENCES**

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