CIRCAC Presentation: Self-Arrest Of Crude Oil Tankers in Lower Cook Inlet

Supported by Cook Inlet Regional Citizens Advisory Council

SAFEGUARD MARINE LLC

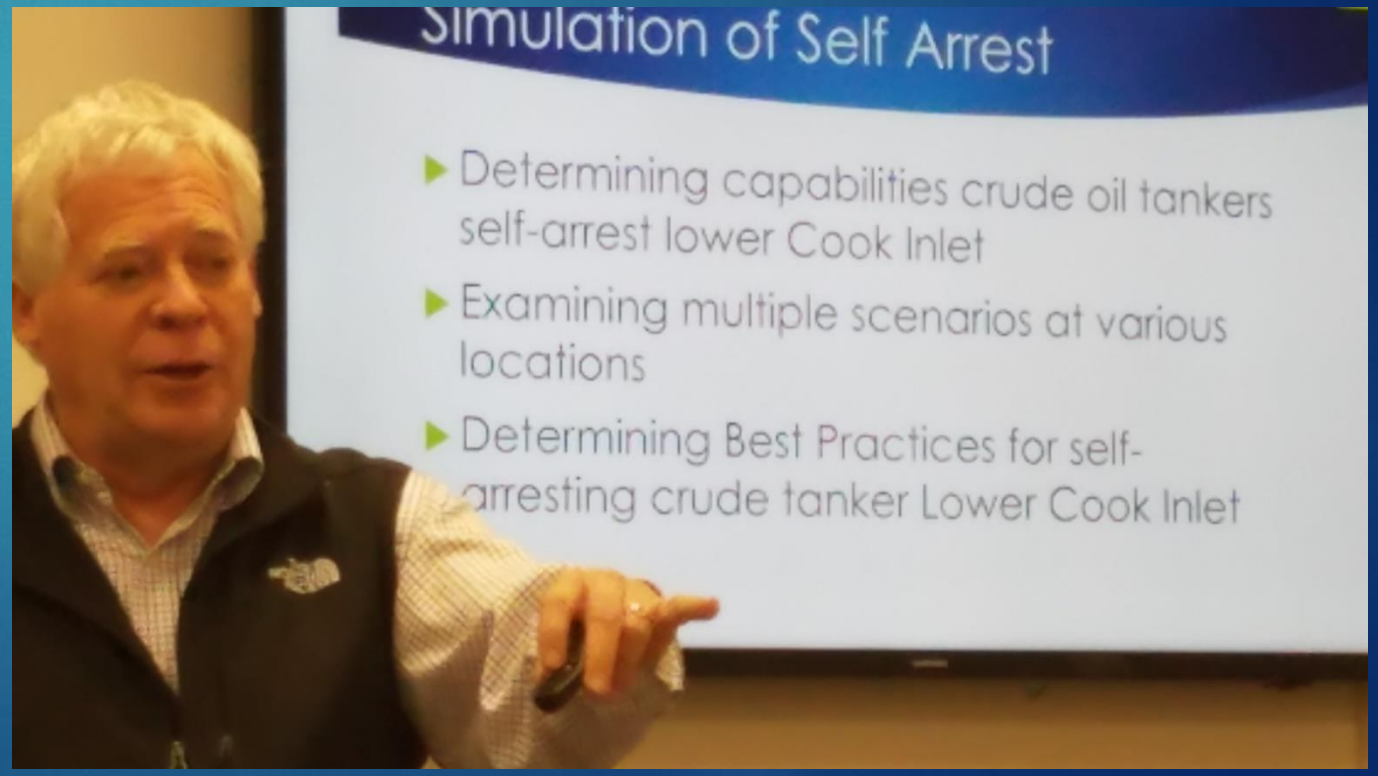
NOVEMBER 30, 2017

Today's Presentation

- Purpose of Research Project
- Personnel and Methods
- Results
- Recommendations

Purpose

- Identify Capability of Tank Vessels to Self-Arrest in Lower Cook Inlet



Personnel and Methods

Safeguard Marine Personnel

Captain Jeff Pierce	President, Co-Primary Investigator
Jonathan Pierce Ph.D.	Vice President, Co-Primary Investigator
Samantha Garrard	Research Assistant
Remington Purnell	Research Assistant
Sarah Huffman	Research Assistant

Personnel Participating in Simulations Represent over 100 Years Maritime Experience

Captain Kaare Elde	Retired Southwest Alaska Pilot
Captain Peter Garay	Active Southwest Alaska Pilot
Captain Josh Weston	Active Southwest Alaska Pilot
Captain Ian Murray	Active Training Southwest Alaska Pilot

Classroom Briefing

Focus Group Participants

Captain Pete Garay	SWAPA Pilot
Captain Josh Weston	SWAPA Pilot
Captain Ian Murry	SWAPA Deputy Pilot
Captain John Schneider	Tesoro Maritime Operations
Mike Munger	Executive Director CIRCAC
Steve "Vinnie" Catalano	Director of Operations CIRCAC
Captain Jeff Pierce	Safeguard Marine President
Dr. Jonathan Pierce	SGM Vice President
Sarah Huffman	SGM Research Assistant

Data Collection and Report

- Interviews with Local Subject Experts and Stakeholders (n=20)
- Simulations of Tanker Self-Arresting Lower Cook Inlet Utilizing Maritime Experts (n=34)
- Focus Group with Maritime Experts and Stakeholders
- Report Completion with Recommendations of best practices submitted to Cook Inlet Regional Citizens Advisory Council

Variables used in Simulations

- Vessel Position
- Current Speeds and Directions
- Wind Speeds and Directions
- Presence of Ice
- Ship models for self-arrest

Results: Simulations and Focus Group

Results

- Simulations were realistic in terms of environmental conditions and vessel maneuverability.
- In all five locations, the vessel was in a temporary safe location.
- In all five locations, the anchor was sufficient for the vessel to self-arrest.
- The level of concern for the maneuver varied by location with Mid-Inlet Drift Transit being the lowest and Nikiski Range being the highest.

In the Simulator Control Room

In the Simulator

In the Simulator

In the Simulator

In the Simulator

Results

- There were ZERO anchor breaks during simulations, but the number of anchors used varied between 1 and 2 depending on location.
- Level of concern was not associated with the number of anchors used.
- Level of concern for self-arrest declined during the second day of simulations.

Statements of Agreement: Overall

- Results indicate that self-arrest is a viable risk mitigation procedure.
- Anchors are an effective tool and should be used for self-arrest in Lower Cook Inlet.
- Knowledge of anchor equipment and capabilities are necessary for a successful self-arrest.

Statement of Agreement: Location

- The process of self-arrest is location dependent. The most immediate concern and primary task is to reduce speed by turning the tanker and balancing vectors of environmental elements. Utilizing an anchor for self-arrest is an art dependent upon many factors, including the human factor.
- Different locations require different processes and practices for self-arrest, and success is dependent upon the level of experience of the mariner involved.

Statement of Agreement: Regulation

- Cook Inlet Harbor Safety Committee should address and discuss ships operating outside of Kachemak Bay awaiting arrival at the Homer Pilot Station.

Statement of Agreement: Pilot Exposure and Awareness

- Pilot level of concern decreased during the second day of simulations. This was due to exposure and practice of performing the self-arrest maneuvers. The greater the amount of exposure a mariner has to self-arrest maneuvers, the more likely they will be successful in performing self-arrest.

Research Shows Self-Arrest of Oil Tanker in Lower Cook Inlet is Possible

- Using properly trained and capable local pilots self-arrest has a high probability of success, but it does not find that this is reliable, and does not find that other mariners could engage in such practices with the same success; unless properly trained.

Research Limitations

- Only 34 simulations were utilized testing many different variables including location, environmental conditions, bottom type, vessel attributes, and various human factors.
- Limited number of pilots participated in simulations (4).
- Additional simulations are necessary to determine probability of how reliable this practice is under varying conditions and with different mariners.
- Using properly trained and capable local pilots self-arrest has a high probability of success, and is a viable risk mitigation procedure, and does not find that other mariners could engage in such practices with the same success; unless properly trained.

Recommendations

1) The Cook Inlet Risk Assessment Final Report (2015) should be updated based upon this study.

2) Local pilot participation in simulations to familiarize them with self-arrest maneuvers will increase the likelihood of success. Further research should be conducted in terms of developing best practices and the benefit of anchor gear for self-arrest in Lower Cook Inlet.

Thank you!

Cook Inlet Regional Citizens Advisory Council

SWAPA

AVTEC Maritime Department