

# Shine a New Light on Ice Breaking

## Icy Fresh TLS

Trinity Lutheran School

- The Coast Guard is responsible for ensuring safe, secure, and environmentally responsible maritime activity in U.S. arctic waters

# Coast Guard To Hold Polar Icebreaker Industry Day March 18



**One-on-one meetings with industry at the General Services Administration beginning March 28.**

# Propulsion

- The Arctic has upgrade to courtment
- U.S. icebreakers which would create
- greater energy availability and capabilities
- in propulsion
- Russia has raised by
- installing a Fiber
- Optic Laser and
- painting the hull
- with Intershield
- 163 Inerta 160
- coating.



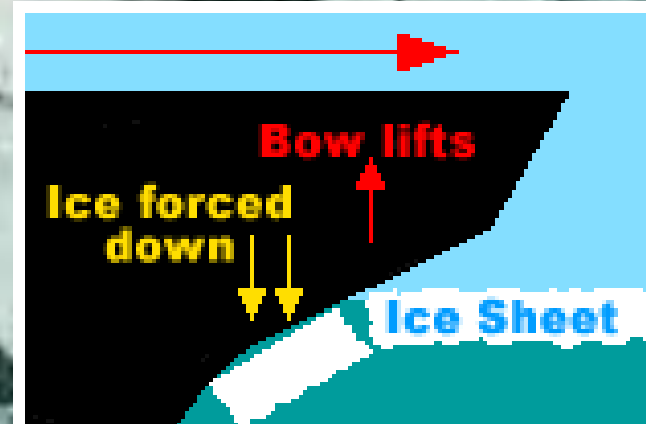
# Polar Sea

*Polar Sea* has been out of service since 2010 due to complete failure of five of her six Alco main diesel engines

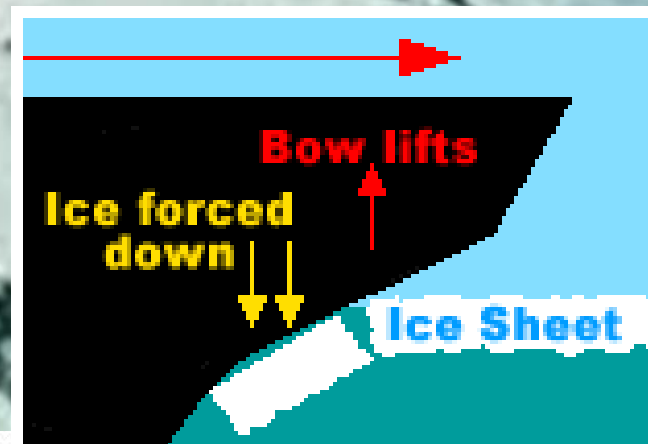
**\$150,000,000 allocated to renovate the Polar Sea**



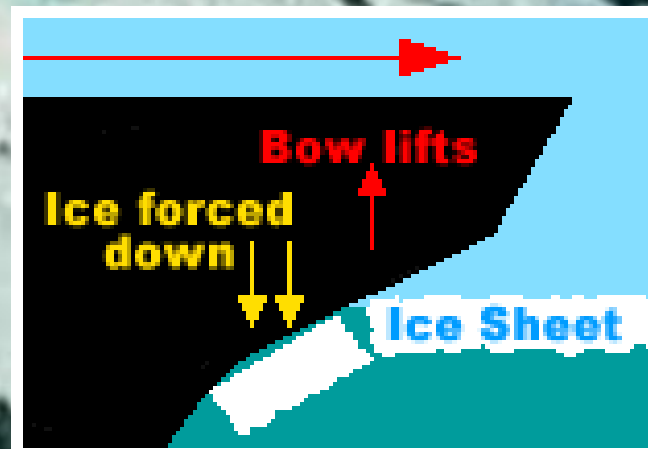
# How Icebreakers Break Ice



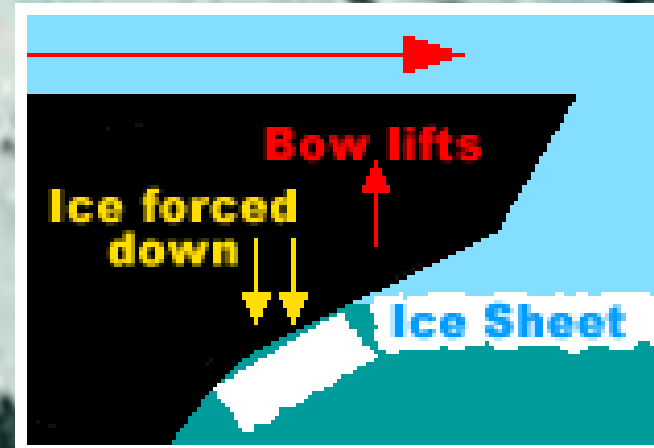
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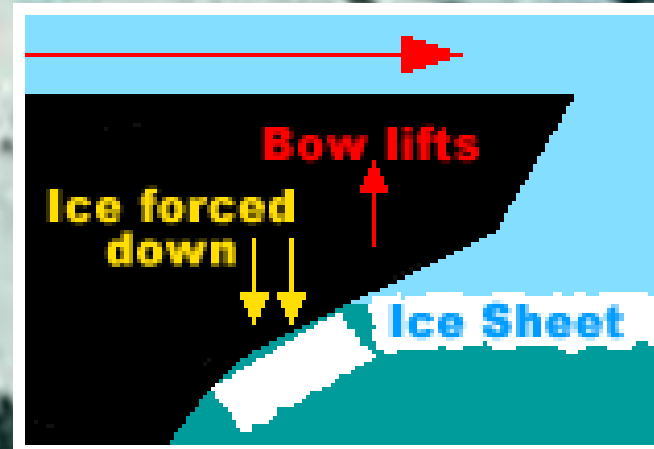


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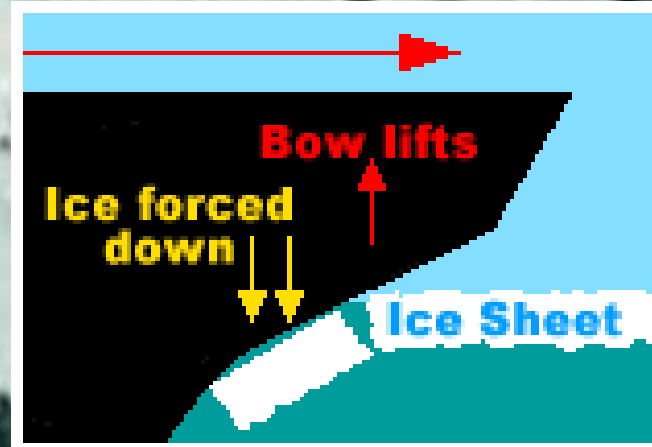




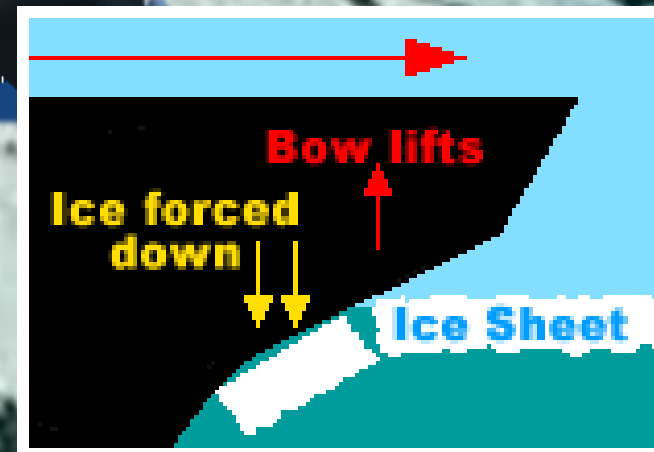
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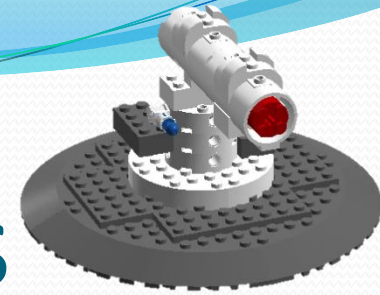
**Sloping bows**  
**Lots of power and mass**

# Laser



Cuts and weakens ice  
Increased speed  
Saves fuel

# Advantages of Fiber Optics



- 1. No moving parts or mirrors in the light-generating source, unlike a conventional CO<sub>2</sub> laser. This has a distinct advantage in terms of reducing maintenance requirements and operating costs.
- 2. Much higher electrical efficiency, resulting in considerably lower running costs. A 4 kW fiber laser uses one third of the power of a 4 kW CO<sub>2</sub> laser of average across-the-board performance.
- 3. 50% longer servicing intervals and 50% lower servicing costs.

<http://www.industrial-lasers.com/articles/2013/11/fiber-versus-co2-laser-cutting.html>

# Fiber Optics Technician

- The technician will connect, test and inspect the fiber optic cabling used in the laser.
- Average yearly salary-\$51,720.
- Education-High School Diploma or Apprenticeship and ETA- certified exam.
- The Fiber Optic Technician will assist with the installation of the Fiber Optic cabling.
- The Fiber Optic Technician must work closely with the Electrician and Electrical Engineer.



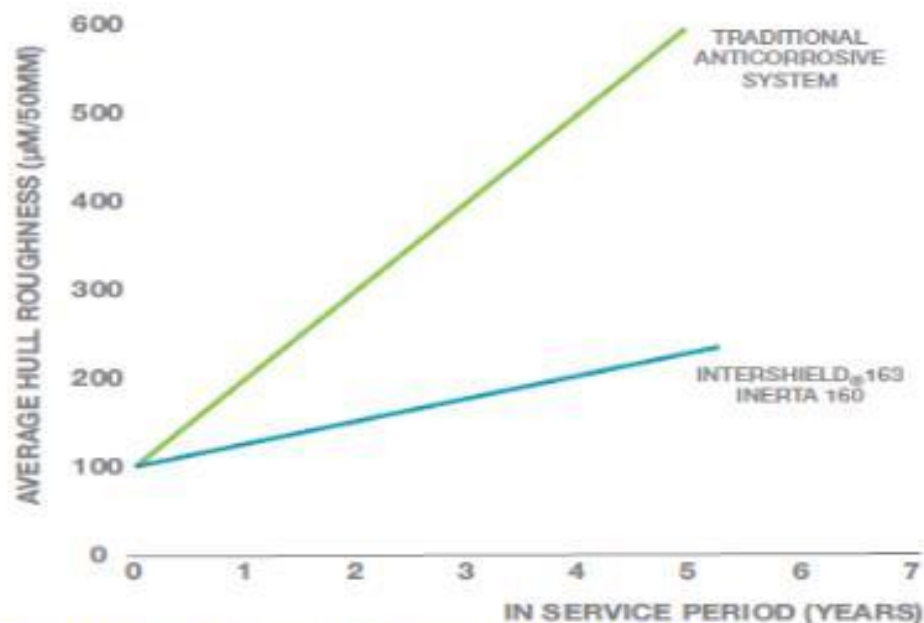
# Benefits of the Intershield 163 Inerta 160

- **Low friction and abrasion**
- **High performance that will last for years**
- **Operational in temperatures as low as -58° Fahrenheit**
- **Controls damage to hull and mechanical parts saving money for future repairs**
- **Controls fuel cost and improves operational efficiency**
- **Up to 2.5x the impact and erosion resistance than standard epoxies**
- **High flexibility, bending stress, and compression**

[http://www.international-marine.com/Literature/Intershield\\_163\\_Inerta\\_160.pdf](http://www.international-marine.com/Literature/Intershield_163_Inerta_160.pdf)

## Abrasion Resistance

- Increasing hull roughness has a significant effect on the efficiency of a vessel moving through water and ice.
- Specially formulated to withstand ice impact and abrasion, Intershield®163 Inerta 160 has a proven track record in controlling surface roughness

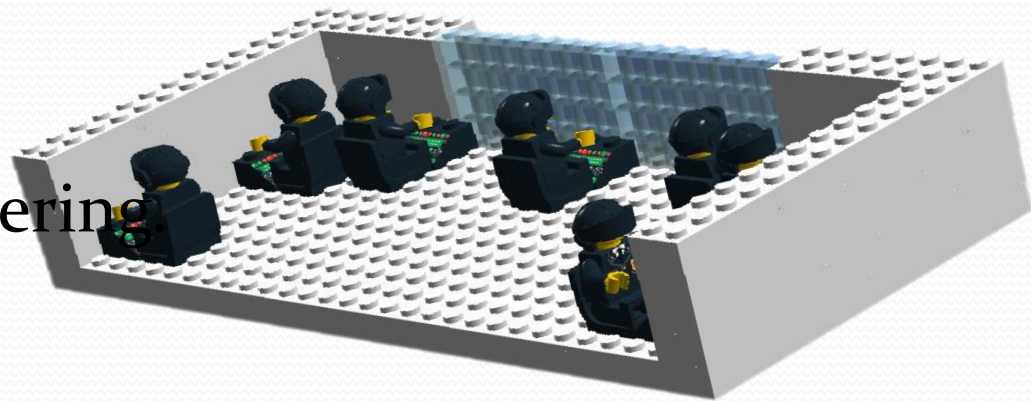


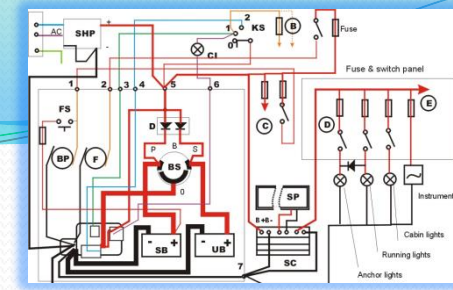
**Intershield®163 Inerta 160 Abrasion Resistant Low Friction Ice Coating for LNGc**



# Marine Electrical Engineer

- Makes sure the electrical equipment is safe and working properly.
- Designs parts for the ship.
- Uses wiring diagrams called schematics to tell the marine electrician what to do.
- Makes models to see how parts will work when putting a laser on a ship.
- Earns \$89,630 per year
- Needs an electrical engineering degree





# The Marine Electrician

- Is responsible for wiring laser to ship, and wiring it to power source
- Annual pay: \$62,000
- Their qualifications: a 4-year industrial electrical apprenticeship and trade certification.
- Courses: technical communications, interpretation of drawings, applied mathematics, and laser safety,.
- Duties: ensure lighting in all areas, ensure all backup power sources are operational, and maintain electrical systems on ship.

Under direction from President Obama, the Coast Guard is accelerating its timetable for heavy polar icebreaker recapitalization.

Under this new timeline, the Coast Guard plans to begin heavy icebreaker production activities in 2020, two years earlier than initially proposed.

WINTER

2015

## POLAR ICEBREAKER Acquisition Program Bulletin



Under direction from President Obama, the Coast Guard is accelerating its timetable for heavy polar icebreaker recapitalization. Under this new timeline, the Coast Guard plans to begin heavy icebreaker production activities in 2020, two years earlier than initially proposed. Associated activity schedules such as RFI and RFP releases, will be accelerated accordingly.

- The Coast Guard has commenced work to guide the heavy icebreaker acquisition program, including:
- evaluating acquisition strategies that will support an accelerated acquisition timeline;
  - reviewing information received through requests for information and engagements with international partners on contemporary heavy icebreaking production and operations;
  - collaborating with multiple federal agencies to define heavy icebreaker requirements, including:



### UPCOMING ENGAGEMENT ACTIVITIES

Industry engagement will be a cornerstone of the heavy icebreaker acquisition program, as it has been for other Coast Guard acquisition programs.

#### MARCH 2016:

The Coast Guard will hold an industry day event that may be combined with one-on-one meetings with interested vendors. Information will be posted to FedBizOpps.gov and the Coast Guard Acquisition Directorate's website (<http://www.uscg.mil/acquisition>) as details become available.

#### COAST GUARD RESOURCES

- Mr. Eric Heller  
Contracting Officer  
[icebreaker@uscg.mil](mailto:icebreaker@uscg.mil)

#### DHS RESOURCES

- DHS Industry Resources  
Acquisition Planning  
Forecast System  
<http://igfs.dhs.gov>
- DHS Small Business  
Specialist Listing  
<http://www.dhs.gov/small-business-specialists>
- DHS Department-wide  
Strategic Sourcing Contract  
Vehicles <http://www.dhs.gov/sha-strategic-sourcing>

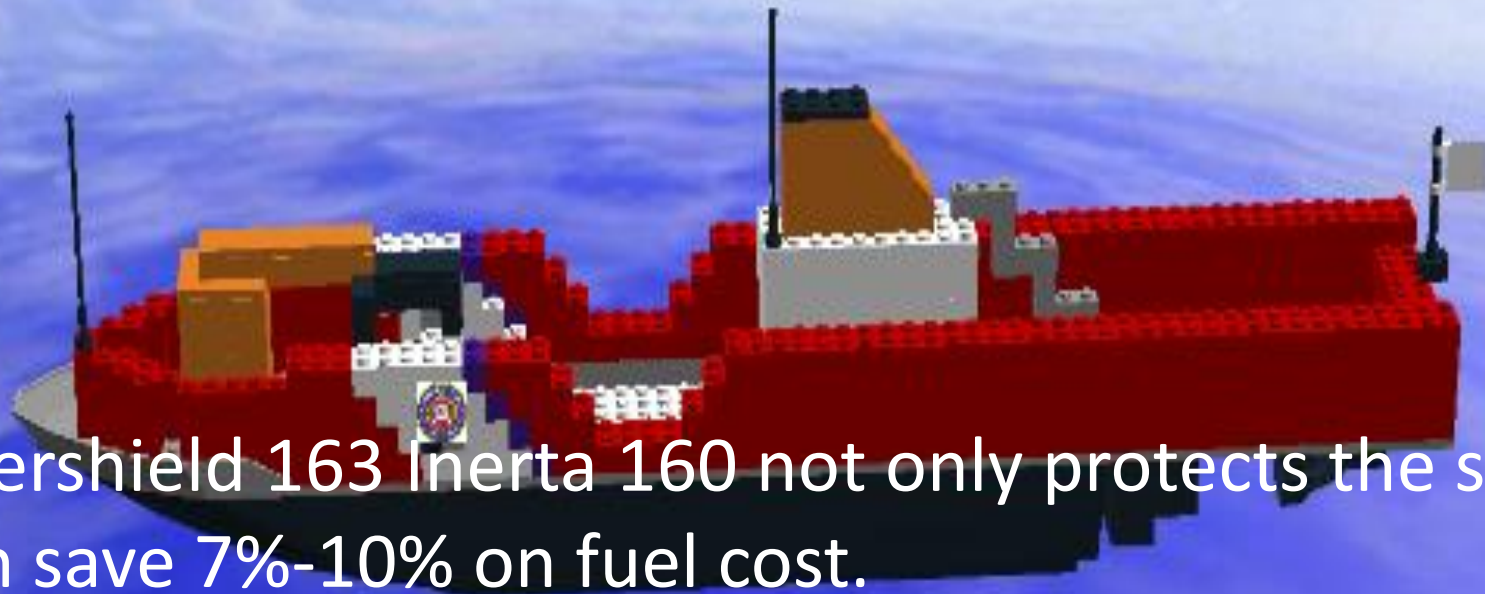


The polar icebreaker acquisition program will provide updates through this bulletin, which will be available online at <http://www.uscg.mil/acquisition/icebreaker/>

# Requirements

- The PIB shall be capable of independently breaking through ice with a thickness  $\geq 6$  ft (threshold) /  $\geq 8$  ft (objective) at a continuous speed  $\geq 3$  kts
- The PIB shall be capable of independently breaking through ridged ice with a thickness of 21 ft
- The PIB shall be capable of breaking a single-pass channel to a width of at least 83 ft.
- [http://www.uscg.mil/ACQUISITION/icebreaker/pdf/PIBIndustryDataPackage\\_Feb2020\(2\).pdf](http://www.uscg.mil/ACQUISITION/icebreaker/pdf/PIBIndustryDataPackage_Feb2020(2).pdf)

# Summary



Intershield 163 Inerta 160 not only protects the ship but can save 7%-10% on fuel cost.

The laser increases the speed and ease with which the icebreaker can cut through the ice.

An investment in the future

# References

- <http://www.reuters.com/article/us-usa-arctic-navy-climatechange-idUSKCN0IA2S52014102/>
- [http://www.international-marine.com/Literature/Intershielld\\_163\\_Inerta\\_160.pdf](http://www.international-marine.com/Literature/Intershielld_163_Inerta_160.pdf)
- <http://www.Intershielld163Inerta160-WhitePaper.pdf>
- <http://www.bbc.com/news/world-asia-25609850>
- <http://news.usni.org/2015/02/25/coast-guard-analysis-says-u-s-needs-3-heavy-and-3-medium-icebreakers-path-to-ships-unclear>
- [https://www.uscg.mil/seniorleadership/DOCS/CG\\_Arctic\\_Strategy.pdf](https://www.uscg.mil/seniorleadership/DOCS/CG_Arctic_Strategy.pdf)
- <http://news.usni.org/2015/12/09/coast-guard-to-finalize-icebreaker-acquisition-strategy-by-spring-production-by-2020>



# References

<http://www.seattletimes.com/opinion/changing-arctic-demands-new-fleet-of-polar-icebreakers/>

[https://www.uscg.mil/acquisition/icebreaker/pdf/Polar\\_Icebreaker\\_2015.pdf](https://www.uscg.mil/acquisition/icebreaker/pdf/Polar_Icebreaker_2015.pdf)

<http://www.uscg.mil/ACQUISITION/icebreaker/default.asp>

[http://www.uscg.mil/ACQUISITION/icebreaker/pdf/PIBIndustryDataPackage\\_Feb2%20\(2\).pdf](http://www.uscg.mil/ACQUISITION/icebreaker/pdf/PIBIndustryDataPackage_Feb2%20(2).pdf)

<http://www.industrial-lasers.com/articles/2013/11/fiber-versus-co2-laser-cutting.html>

<http://www.bizjournals.com/seattle/news/2016/03/10/1-billion-icebreaker-contract-could-be.html>