THE GLOSTEN ASSOCIATES
Consulting Engineers Serving the Marine Community

UNOLS Hybrid Winch Design

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Purpose

2008 - Glosten commissioned to provide technical input

- Wire Safety Factors
- Current Handling Gear (Winch and Frames) Design Comparison:
  - **ABS Underwater Handling Gear**
  - **USCG Subchapter U Wet Weight Handling Gear**
- Future Handling Gear Design Standards

Summary

Proposing “next generation” design and operational standards:

- **“Hybrid System” combines USCG and ABS standards:**
  - Use USCG for structural frames and structural hull interfaces (foundations)
    - hull structure is not at risk if wire break events occur.
  - Use ABS standard for winch design
    - allowing for lighter winches with auto render to reduce risk on larger systems
- **Winch owner selects wire safety factor (and hence wire size)**
  - 3.5 on Design Load is recommended based on wire safety factor study
- **“Hybrid System” version of Appendices A and B:**
  - Apply to portable and vessel specific winches and deck gear
  - Could apply to modified existing systems
  - Apply to uninspected and inspected vessels after USCG approval and modification to 46 CFR 189.35
- **Will not pursue ABS classing or certification of an overboard handling system**

Today's Goal and next steps

Today:

Discuss approach and gain consensus that the proposed hybrid system is worth taking to the next step.

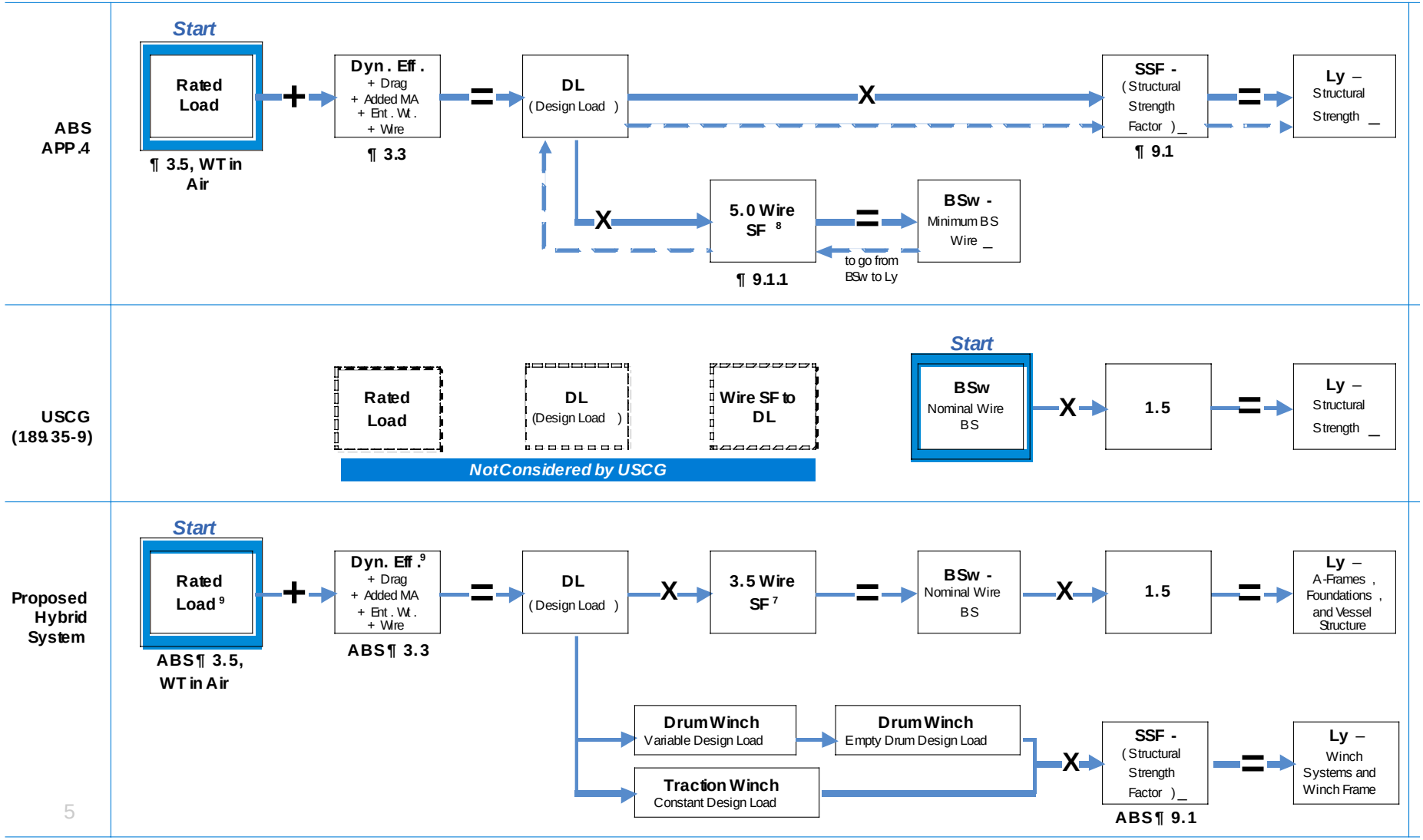
The Next Step:

Take the hybrid system to USCG for acceptance:

- vessel structural interfaces and frames and booms will meet 46 CFR 189.35-9,
- winches meet the ABS Rules for Certification of Handling Systems, with an owner specified safety factor.

Gain USCG assurance that the inspected vessels would not be violating the Regulation by using the UNOLS hybrid system.

Design Criteria Comparison



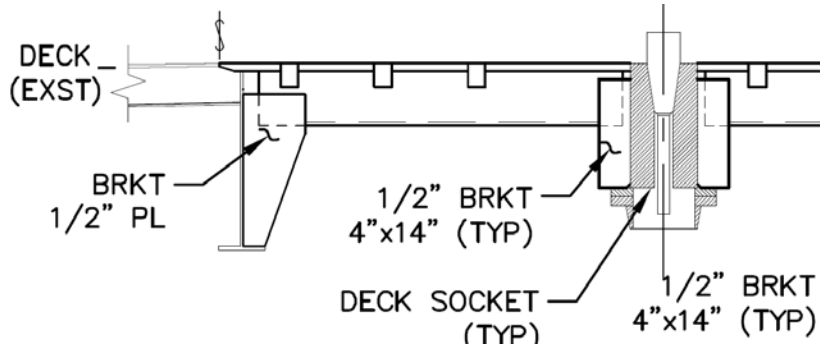
USCG CFR System

UNOLS Positive

- Operator has complete freedom to set wire safety factors
- Deck Gear is not restricted in its service: Any operation allowed up to the break strength of the wire

UNOLS Negative

Deck Gear is heavily built to accommodate unknown load contributors and winch costs are high



USCG CFR System

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UNOLS Negative: Wire Breakage

(controlled by operator: RVSS Appendix A)

~$75k, no casualties

ABS System

UNOLS Positive

• Lighter Winches designed for actual operational loads: Design Load

UNOLS Negative

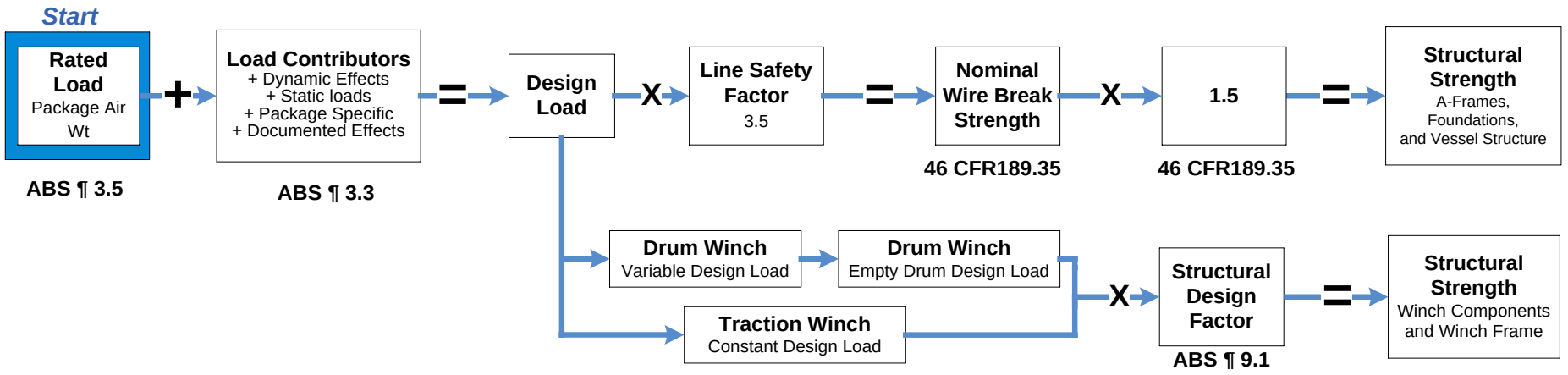
• Wire Safety factor of 5 required on Design Load

• Example: Typical Jumbo Piston corer would need 1-3/8” wire or 1-1/4” plasma

Hybrid System

Combine features of CFR and ABS Systems

- CFR System protection for the vessel
- ABS System optimized winches for the known operational loads (Design Load)



Hybrid System

Design Team Roles

- Driven by the Winch Owner
- Enabled by the Deck Gear Designer and Naval Architect