GRAB SHIP UNLOADER
GPU SERIES

Introduction:

The grab type ship unloader is the traditional method to unload bulk cargo. A clamshell bucket is cycled in and out of the ship hold, unloading with each scoop 11-15m^3, depending on the design specifications.

The clamshell is suspended from a traversing trolley and is raised and lowered by a winch. The ship unloader typically incorporates a hopper that provides a metered material flow to the pier conveyor and traverses the ship on pier-mounted rails to access each hold.

ANSYS 3D model design and calculations:
All structural assemblies for the Genma grab type ship unloaders are checked by ANSYS design software to ensure the strength, rigidity and stability with all component parts being virtually assembled through 3D modelling before manufacture

Incorporates four reel mechanical differential for operating functions including:

1. Grab trolley
2. Lifting drum
3. Closing drum
4. Grab
5. Plane tray differential reducer

Includes efficient environmental functions:

Through utilizing the gravitational energy from the grab crane operation to effectively supplement the electrical energy requirements both the operating economics and performance are optimized.
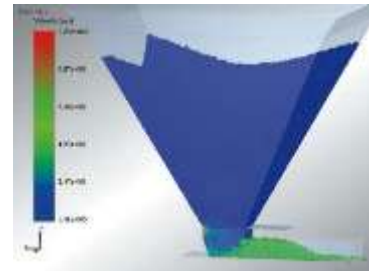
Operating stability:

Integrated communication between both mechanical and electrical operating functions is designed to ensure that the steel structure as the skeleton, programme as the intelligence and operating components as the organ perform each as indispensable elements.

Design optimisation through EDEM bulk SIM simulation:

Each operational function of the ship unloader is optimised through EDEM bulk SIM simulation for qualitive and quantitative performance verification.

Machine low weight structural assembly:

By combining the separate lifting opening and closing mechanism and trolley functions into a single simple assembly including a wire rope winching system which is wear resistant enables the use of less wire rope ensuring a reduces total weight.

Machine structure optimization:

The lifting crane design is optimized through:

1. Reduced centre of gravity height for les wind surface resistance
2. Operating speed optimization through integrated mechanical and electrical control functions
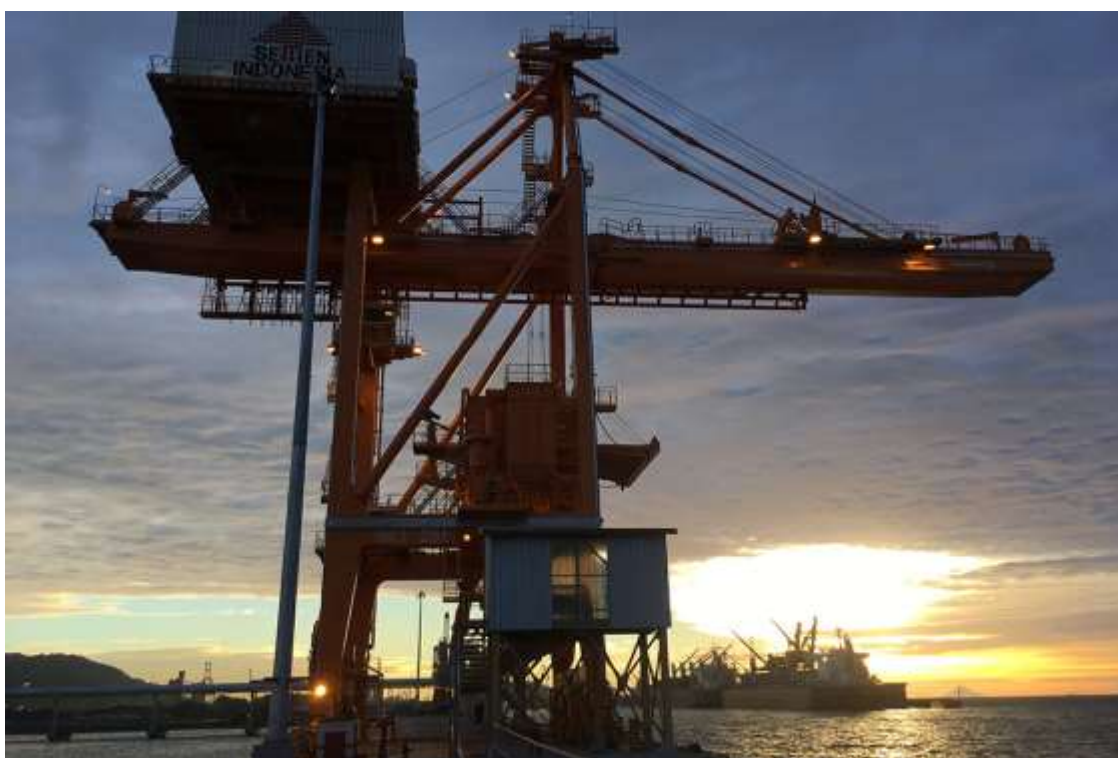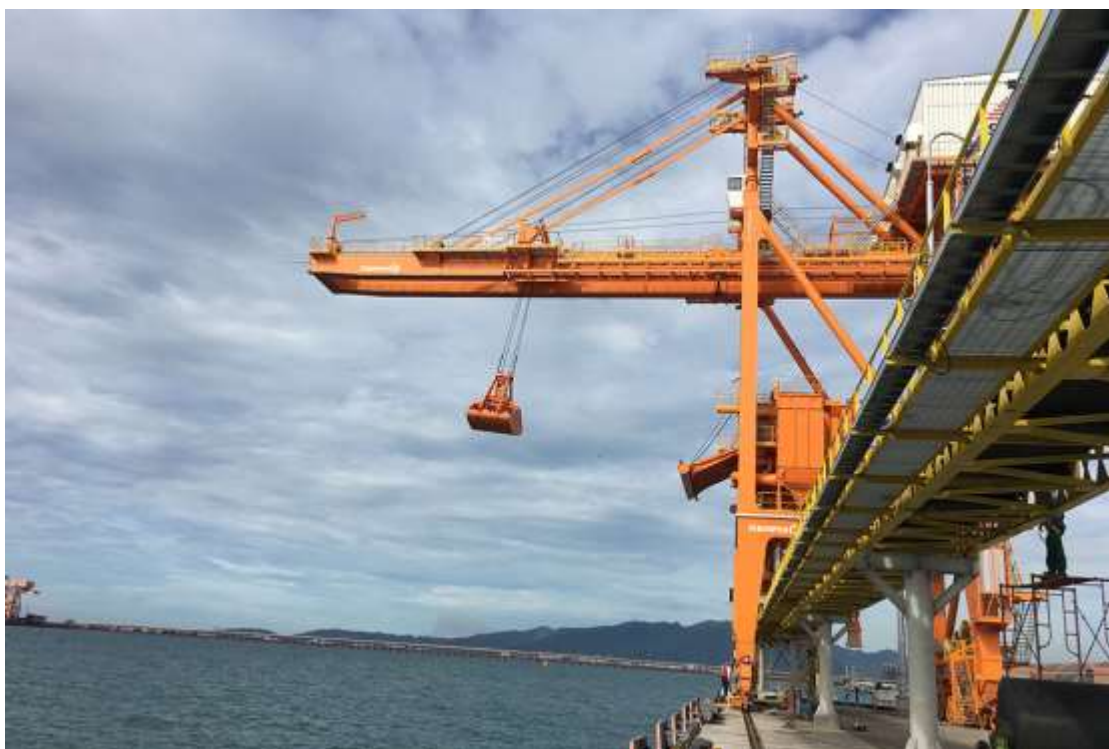
Incorporates latest intelligence feedback:

The operating system enables:

1. Remote monitoring of all functions
2. Machine fault diagnosis system
3. Continuous energy feedback for optimizing actual performance

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