Every year, ABS undertakes more than 100 technology projects, including joint development and industry research projects. These projects, along with partnerships with leading academic institutions around the world, support the development of new, industry-leading Rules, Guides, Guidance Notes, Advisories and software applications that help address pressing regulatory and operational issues. Top areas of research include gas as fuel, environmental regulatory solutions, energy efficiency, hull optimization, human factors safety and future regulatory and safety issues such as cybersecurity and data analytics.

Container Deck Firefighting

Container fires continue to be a critical hazard for all containership operators. As vessels and stack heights continue to grow, the task of container deck firefighting is becoming even more challenging. ABS is at the forefront of this issue, publishing its *Guide for Fire-Fighting Systems for On-Deck Cargo Areas of Container Carriers*. By applying this tool, owners and operators can take advantage of a clearly defined system of firefighting resources dedicated to cargo deck protection. This optional, enhanced criteria builds on SOLAS regulations leading to better preparation for potential incidents that threaten the safety of the ship, crew and cargo.

Cargo Securing

As ships get larger, container stacks grow higher and stack weights increase, improving safety and reliability of cargo securing systems is an absolute necessity. To assist in finding unique solutions to this challenge, ABS developed the ABS *Guide for Certification of Container Securing Systems (Lashing Guide)*. The Guide addresses lashing system technology, including the effects of fully automatic twistlocks, as well as defining the procedure for lashing bridge strength evaluation. It also introduces a nonlinear lashing analysis procedure established on rigorous analytical models that represents a significant upgrade to other linear-based procedures.

ABS C-LASH™ software was also developed to fully implement all the analysis features covered in the nonlinear lashing analysis procedure. The software employs the most modern, non-linear analysis methods to realistically model lashing arrangements, allowing designers to provide safer and more efficient cargo securing systems.

Shaft Alignment

ABS provides full-scale shaft alignment technical services, including analysis, optimization, measurements, condition evaluation, trouble shooting and failure investigation. Utilizing