

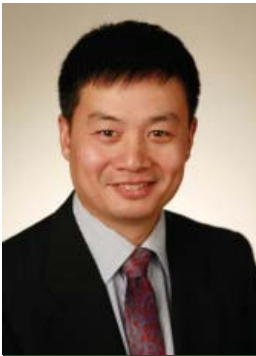
TAPS Tankers Monitored for Corrosion and Cracks

First Commercial Testing Using Acoustic Emissions in a Marine Environment

A joint development project between Alaska Tanker Company, ABS and MISTRAS has the potential to change classification society practices. If successful the pilot project, which is the first commercial application of the latest acoustic emission technology in the marine industry, could lead to the introduction of new survey procedures. Testing has taken place on an ATC double hull TAPS trade tanker, the *Prince William Sound*, using acoustic emission sensors to detect crack initiation on the 125,000 dwt vessel.

midship of the vessel. The sensors can electronically detect rapid stress-releasing events, such as the release of elastic energy in materials which then becomes an elastic wave.

According to the American Society for Testing and Materials (ASTM) the source of these emissions or waves is closely associated with the dislocation movement accompanying plastic



*George Wang,
Senior Managing
Principal Engineer*

George Wang, Senior Managing Principal Engineer, ABS Operational Safety & Evaluation, explains that sensors were placed on the deck near the



ABOVE: An acoustic emission sensor placed on the deck of an Alaska Tanker Company double hull TAPS trade tanker, the PRINCE WILLIAM SOUND.

LEFT: ABS Senior Managing Principal Engineer George Wang participates in the installation and wiring of the acoustic emission sensors.



use acoustic emissions to better help us identify critical areas within the targets so that we can further refine the survey process. This targeting will help focus owner's inspections and class surveys on suspected areas of structural degradation."

areas is a detection tool that could be readily adopted by industry if shown to be effective. Wang stresses that the joint development project is still in the early phase of data gathering from the Alaska Tanker Company's tanker in service from Puget Sound in Washington to the Alyeska Marine Terminal in Valdez, Alaska.

Alaska Tanker Company participates in the first commercial testing of acoustic emissions technology by allowing one of its ships to be monitored with the sensors.



deformation and the initiation and extension of cracks in a structure under stress.

Acoustic emission testing is a form of non-destructive testing (NDT) commonly used in the nuclear and pipeline industry to detect stress. However, it does not have widespread application in the marine industry.

"The possibility of adapting this technology to the marine world is very exciting," says Wang. "We have been searching for new NDT technologies that require minimum downtime for a vessel. We want to

According to Wang, using acoustic emissions would allow for structural conditions to be monitored while the vessel is at sea. It is not intended that acoustic emissions replace current survey practices but, in the long term, this study and its subsequent findings could lead to more efficient and effective survey methods, and also shorten the downtime required of the vessel.

The ability to "hear" cracks at the very earliest micro stage and detect the early beginnings of corrosion that cannot be seen by the human eye or that occur in less accessible

Alaska Tanker Company provides marine transportation of Alaskan crude oil produced by BP to refiners on the west coast of the US and in Hawaii. The company currently operates a fleet of five double hulled tankers ranging in capacity from 125,000 to 185,000 dwt. Alaska Tanker is jointly owned by BP Oil Shipping Company, Keystone Alaska, and OSG Ship Management. MISTRAS is a NDT inspection service company that offers acoustic emission testing. ABS is the classification society most familiar with the US flagged, Jones Act tankers operating in tough weather environments.