



Underwater Radiated Noise of Ships: Measurement and Mitigation

Christ DE JONG ¹

¹TNO Acoustics and Sonar, The Hague, Netherlands

ABSTRACT

Ships radiate underwater sound due to their propulsion, the operation of equipment and the flow around the hull. Most of this sound is unintentional and unwanted and therefore generally categorised as 'noise'. Radiated noise control is of interest for regulators and for ship operators who may want to limit the effects of shipping noise on marine life or to be able to operate covertly, without being detected by underwater acoustic sensors. But ship radiated noise depends on many parameters, related with ship design and operation as well as with the current state of maintenance and the environment in which the ship is operating. Can ship radiated noise be quantified and measured in a meaningful manner? Navies have special range facilities at which they check the acoustic 'signature' of their vessels against requirements. With increasing cooperation between nations, the comparability of the results has become an issue. An international round robin study in which two research vessels were measured at various naval ranges has provided valuable information on the uncertainties associated with the radiated noise measurements at different ranges. A procedure for the dedicated pass-by tests in which the ship cooperates to have its radiated noise measured at various speeds and settings, has recently been described in a first international standard for surface ship radiated noise measurements (ISO 17208-1). A standard for pass-by tests in shallow water is under development. Published data of radiated noise from ships of opportunity, measured along shipping routes, are generally difficult to compare, because of the lack of standard procedures for measurement, data analysis and reporting. Insight in the uncertainties associated with these data is essential for the development of models for ship radiated noise and the evaluation of the effectiveness of possible mitigation measures for shipping noise, like local speed limits or regulation to ban 'noisy' ships.

¹ christ.dejong@tno.nl