Radioisotope Contamination
Issues beyond Health & Safety

Standard procedures used to ensure the radiological safety of a ship for normal use are not adequate to detect the low levels of radiocarbon or tritium that could seriously compromise the integrity of samples collected by natural level scientists. As an example, say a series of experiments with a total of 10mCi of ^{14}C are conducted and one of the 100 bottles is dropped on the floor. Even if 99% of the spill is cleaned up, there is still 1 μCi left on the floor. This will dry up and turn into a residue/dust. If just 1/1000 of that residue is carried out on shoes, and then only 1/10,000 of that ends up in a natural abundance sample, it increases its activity by 5 times and effectively ruins the study.

Similar contamination issues exist for ^{3}H. Typical spike solutions for tritiated thymidine contain about 10^{11}-10^{12} times natural levels in seawater. Moreover, tritium-powered exit signs and luminous dial divers' watches can contain more than a million times the amount of tritium contained in all the tritium samples collected in the history of modern oceanography. A very small leak could lead to gross contamination.

Even ^{13}C, a stable isotope that is not a Health and Safety hazard, can cause issues with natural abundance. The ^{13}C as a spike can present serious threat to the ^{13}C natural abundance studies. Plus, many of the compounds enriched with ^{13}C are prepared in commercial labs that also prepare compounds enriched in ^{14}C.

Clearly, a little contamination goes a LONG way. It is up to all the research vessel users to keep the ships clean for everyone. The UNOLS Radioisotope Contamination Awareness Program has tools to help. Visit the website:
http://www.unols.org/info/RadioisotopeUse/RadAwareness.html

Everyone must do their part. Please be sure to to spread this information to all of your Authorized Radioisotope Users.