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Tritium Laboratory
27 April 2015

SWAB REPORT # 767

SWAB DATE: 18 April 2015

R/V Hugh Sharp

James Happell
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Distribution:
SWAB Committee
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COMMENTS TO SWAB REPORTS 12 May 2014

Typical LSC instrument background values for ^{3}H and ^{14}C are 2 and 5 cpm, respectively. The LSC is a Tricarb 2910 TR with the low level counting option.

All samples are counted for 60 minutes, the instrument background is subtracted, and activities are reported in dpm/m^2. Bucket blank activities are not subtracted. Counting errors (2 standard deviations) are also reported in dpm/m^2. An error larger than the activity indicates that the activity is not significantly different from zero.

Criteria for SWAB Results

Category	^{3}H (dpm/m^2)	^{14}C (dpm m^2)	Recommendations
A	<500	<50	No action
B*	500-10,000	50-10,000	Needs cleaning before any natural tracer work. Decks in radiation vans with activities above 1000 dpm/m^2 should be cleaned.
C**	10,000-100,000	10,000-50,000	Must be cleaned before any use.
D***	>100,000	>50,000	May be a health hazard. Notify local radiation safety official.

Note: ^{14}C and ^{35}S have peak energies of 156 and 167 KeV, respectively; thus ^{35}S will be registered as ^{14}C by our counting techniques. Categories A, B and C are not a health hazard.

Recommended Cleaning Proceedure

Wearing ordinary household rubber gloves:

^{3}H: Wash and scrub with radioactive cleanup detergent such as COUNT-OFF (50 ml COUNT-OFF to 4 liters of water), using sponges to distribute solution and reabsorb it.

^{14}C: Wash with 1% sulfuric or 2% hydrochloric (muriatic) acid with good ventilation (will dissolve carbonates, releasing $^{14}CO_2$). Follow up with wash as if for ^{3}H.

Disposal of Cleaning Materials (gloves, sponges, etc)

Categories A & B dispose as ordinary garbage, C & D contact your institution's radiation safety office.

Note: If category C or D is encountered, we try to notify the insitution promptly by phone or email.

REPORT FOR SWAB # 767

LOCATION: Lewes, DE
VESSEL: *Hugh Sharp*

DATE: 18 April 2015
TECHNICIAN: Charlene Grall

Sample #	Sample Identification	^{3}H dpm/m^{2} activity		error	^{14}C dpm/m^{2} activity		error
1	1st Vial Bkgnd	0	±	0	0	±	0
2	Initial bucket blank	66	±	51	-18	±	43
	Dry Lab (Figure 1)						
3	Sink area	**41532	±	557	*612	±	21
4	Deck below sink	231	±	52	*120	±	37
5	Port benchtop across from sink	65	±	51	-14	±	33
6	Port benchtop across from whirpool refrigerator	73	±	57	-31	±	76
7	Deck between port benchtops	184	±	49	*104	±	37
8	Inside whirpool refrigerator bottom	69	±	52	-20	±	50
9	Inside whirpool freezer top	48	±	60	-26	±	63
10	Deck at entrance to Wet Lab	376	±	66	*66	±	30
	Wet Lab (Figure 1)						
11	Port sink area	116	±	53	-15	±	37
12	Deck between aft and port sinks	39	±	45	-1	±	65
13	Deck next to CTD train	57	±	52	-4	±	10
14	Forward starboard benchtop next to CTD	26	±	46	-3	±	8
15	Inside chest freezer	47	±	56	-23	±	56
16	Inside Whirpool fridge	83	±	32	*103	±	38
17	Inside Whirpool freezer	48	±	34	37	±	35
18	Deck at entrance to Workshop	24	±	49	-7	±	17
19	Final bucket blank	30	±	53	-14	±	33

Comments

Please note that the error reported for each isotope is the two-standard deviation counting error.
The reports may now contain values less than zero. When decay counting background samples will be distributed about the background vial, which means that negative values are possible. In the past we rounded the negatives values to zero. Values are only significantly above background when they are positive and larger than the error. There appears to be moderate ^{3}H contamination in the dry lab sink area and minor ^{14}C contamination in several areas. The same group which has been doing something in the past year to cause false positives on the LSC was on this cruise it is likely that most of the minor ^{14}C contamination is actually this false positive. We also counted sample #3 on our gas proportional counter which is not affected by light producing false positive compounds and we found 615 dpm/m^{2} of ^{3}H. Therefore most of the signal in sample 3 appears to be a false positive, but ^{3}H is also present. All areas with ^{3}H and false positive ^{14}C should be cleaned.

RV Hugh Sharp Lab Spaces

Figure 1
SWAB # 767
18 April 2015