



Australian Government

**Australian Radiation Protection
and Nuclear Safety Agency**



ARPANSA's Marshall Islands Fish Monitoring Program

Marcus Grzechnik & Liesel Green



Australian Government

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ARPANSA-IAEA-Marshall Islands Collaboration

*ARPANSA's Marshall Islands Fish Monitoring Program
Capacity Building in Australasia – Collaborations and Future
Possibilities*

Liesel Green & Marcus Grzechnik

IAEA Project – Developing a National Radioactivity Monitoring Capacity

The Marshallese Government requested the assistance of IAEA for developing capacity for:

- Environmental radioactivity monitoring
- Radiation dose assessments
- Provision of public information



Status of Ongoing TC Programme 2020-2021

- Building Core Capacities to Control Contaminants and Other Residues in Food — Phase I

MHL5002



- Improving the Quality of Radiology Services
(Pending Closure)

MHL6001



- Improving the Quality of Clinical Services in Radiology - Phase II (2018-21)

MHL6002



- Developing a National Radioactivity Monitoring Capacity
(Pending Closure)

MHL7001



- Establishing Technical Capabilities for Groundwater Resources Management *(Pending Closure)*

MHL7002



- Developing National Radioactivity Monitoring Capacity - Phase II (2018-21)

MHL7003



- Strengthening the National Infrastructure for Radiation Safety (2018-21)

MHL9004



Training Program - MHL 7003 Phase II

Aim: Build on the IAEA training conducted in 2017

ARPANSA Training 1: 2-5 March 2021

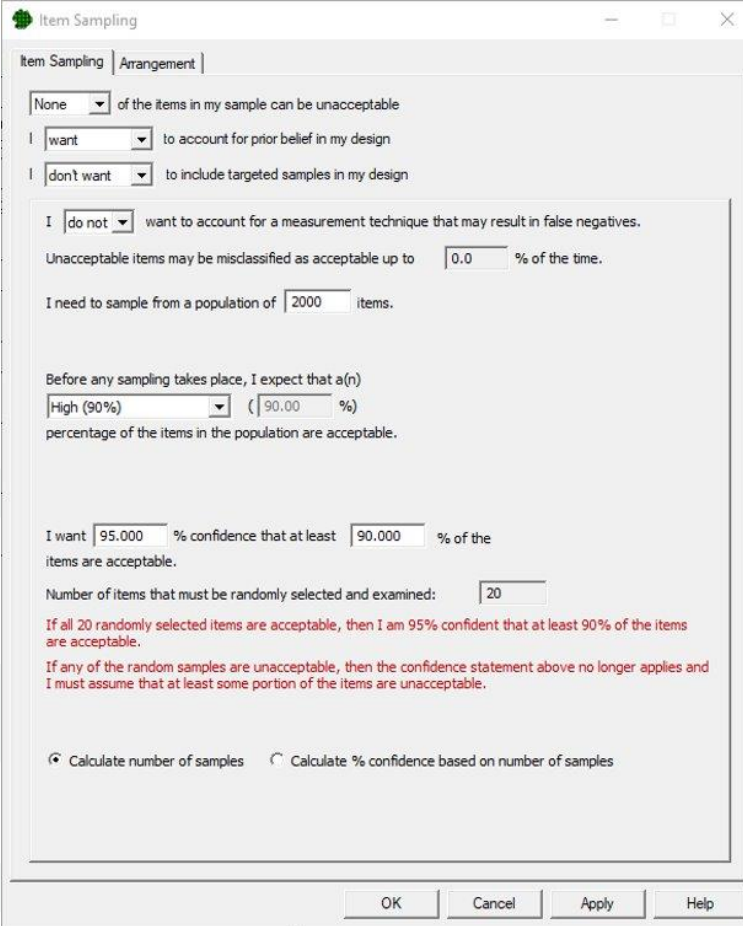
- Radiation Protection in Marshall Islands (Existing exposure situation)
- Monitoring Strategy
- Radiation and application to Dose
- Environmental Sampling Techniques
- Gamma Spectrometry
- Laboratory Quality System



Training Program - MHL 7003 Phase II

ARPANSA Training 2: 21-23 September 2021

- Radioecology
 - Dose Calculations
 - Seawater Measurements for Radiocaesium
 - Exposure due to Radionuclides in Food
 - **Visual Sample Plan** Item Sampling, Fish Sampling
 - Stakeholder Engagement and Communication Planning
 - Fish Market Monitoring Program
- Draft project documents



The screenshot shows the 'Item Sampling' software window with the 'Arrangement' tab selected. The window contains several input fields and dropdown menus for configuring a sampling plan. The 'None' dropdown is selected for 'of the items in my sample can be unacceptable'. The 'I want' dropdown is set to 'want' and the 'I don't want' dropdown is set to 'don't want'. The 'I do not' dropdown is set to 'do not'. The 'Unacceptable items may be misclassified as acceptable up to' field is set to '0.0'. The 'I need to sample from a population of' field is set to '2000'. The 'Before any sampling takes place, I expect that a(n)' dropdown is set to 'High (90%)' and the 'percentage of the items in the population are acceptable' field is set to '90.00'. The 'I want' field is set to '95.000' and the '% confidence that at least' field is set to '90.000'. The 'Number of items that must be randomly selected and examined' field is set to '20'. The window also includes a red warning message and two radio buttons at the bottom for calculating the number of samples or the percentage confidence based on the number of samples.

Item Sampling

Item Sampling | Arrangement

None of the items in my sample can be unacceptable

I want to account for prior belief in my design

I don't want to include targeted samples in my design

I do not want to account for a measurement technique that may result in false negatives.

Unacceptable items may be misclassified as acceptable up to 0.0 % of the time.

I need to sample from a population of 2000 items.

Before any sampling takes place, I expect that a(n) High (90%) (90.00 %) percentage of the items in the population are acceptable.

I want 95.000 % confidence that at least 90.000 % of the items are acceptable.

Number of items that must be randomly selected and examined: 20

If all 20 randomly selected items are acceptable, then I am 95% confident that at least 90% of the items are acceptable.

If any of the random samples are unacceptable, then the confidence statement above no longer applies and I must assume that at least some portion of the items are unacceptable.

☒ Calculate number of samples ☐ Calculate % confidence based on number of samples

OK Cancel Apply Help

Fish Market Monitoring



ARPANSA is providing assistance and capacity building in the development of a project plan that can be expanded to other environmental assessments conducted by Marshall Islands Marine Resource Authority (MIMRA) and the Marshall Islands EPA

- Development of strategy
- Sample and analysis considerations
- Logistics - local conditions and shipping samples to ARPANSA
- Information and data management
- Public information



Fish Market Monitoring (cont.)



- Expertise of staff in MIMRA and the Marshall Islands EPA to develop target species and sampling procedures
- Build on the Marshall Islands EPA methods developed during the TCP
- ARPANSA to provide support to both documenting and developing the program
- ARPANSA to provide support through:
 - *Verification of screening measurements conducted by MIMRA/EPA laboratories*
 - *Additional analysis of samples for Pu and Po at ARPANSA*

Target species

kūro, jilo, Paan, merã, kupañ, Orange spine unicorn fish and Humpback red snapper

Target radionuclides

$^{239+240}\text{Pu}$, ^{241}Pu , ^{241}Am , ^{137}Cs and ^{90}Sr and ^{210}Po , ^{210}Pb

Australasian Radioanalytical Laboratory Network



National capacity building activities

Gamma spectrometry capability exercise
2013 – 2015 – 2018 – 2021

Gross alpha & gross beta capability exercise
2020 - ongoing

Is there scope for further expansion and increased activities?



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THANK YOU

CONTACT ARPANSA

Email:

info@arpansa.gov.au

Website:

www.arpansa.gov.au

Telephone:

+61 3 9433 2211

Freecall 1800 022 333

General Fax:

+61 3 9432 1835

