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RN Particulate Network QA/QC Program 2020: Challenges and lessons learned during the global COVID-19 pandemic crisis

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ABSTRACT

The global response to contain the SARS-CoV-2 (COVID-19) pandemic in 2020 has brought numerous unprecedented challenges in the implementation of the IMS Radionuclide Network QA/QC Program. In spite of the difficult situation, the IMS Radionuclide Network QA/QC Program managed to continue. This presentation will discuss the challenges experienced by all stakeholders throughout the sample chain-of-custody and the lessons learned during the COVID-19 crisis.

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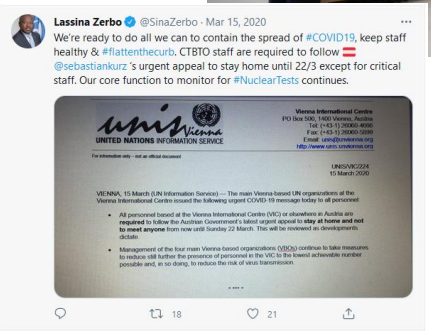

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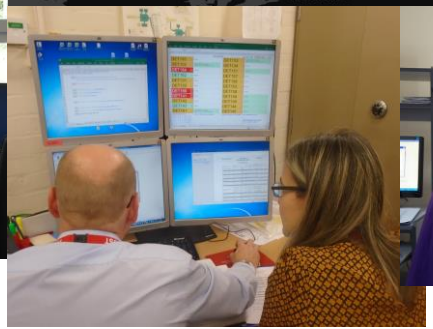
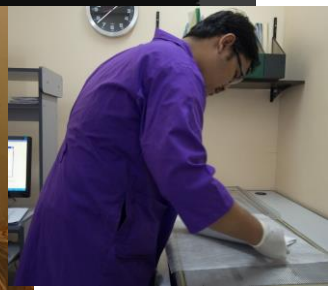
INTRODUCTION

- Since 2004, the PTS requests, on a quarterly basis, a random sample from a certified radionuclide particulate station to be sent to an IMS-certified radionuclide laboratory for re-analysis as part of its IMS Radionuclide Network QA/QC Program.
- The global response to mitigate the spread of the COVID-19 in 2020 caused some disruptions to the regular operation and maintenance of the International Monitoring System





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METHODS

Sample Selection and Notification Process

- Station samples are selected randomly and dispatched to a randomly selected laboratory for re-analysis
- Status of sample dispatch is regularly monitored based on the flow of messages between PTS and Stations/Laboratories
- Issues that occur at any point of the sample shipment are communicated with the Station or Laboratory through a Problem Report (PR) in the IMS Reporting System (IRS)

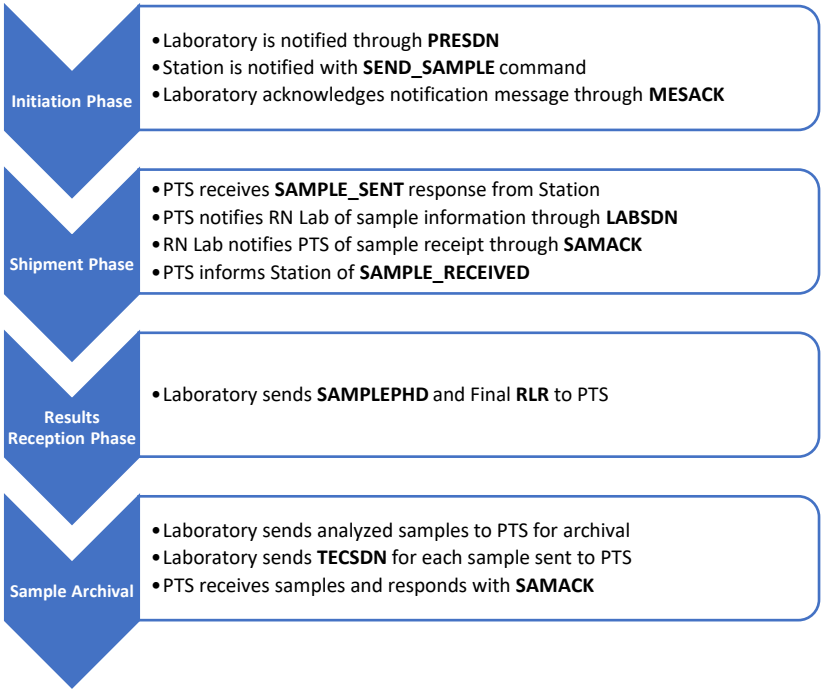

***Figure 1**. Flow of messages between PTS and Station/Laboratory for sample shipments*

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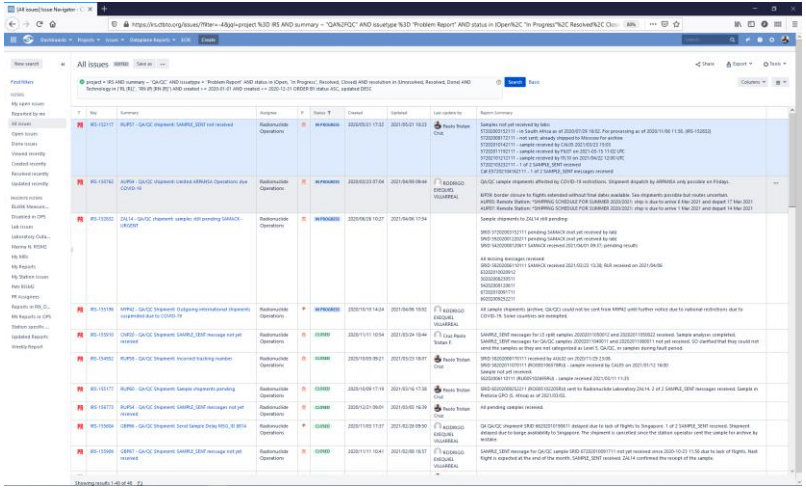
METHODS

Evaluation

- Durations for Shipping, Transport, and Analysis of samples were evaluated based on reported time stamps in sample chain-of-custody messages and compared with previous years (2018, 2019)
- Problem Reports related to disruptions in QA/QC sample shipments that were created in the IMS Reporting System (https://irs.ctbto.org) between 01 January to 31 December 2020 were evaluated



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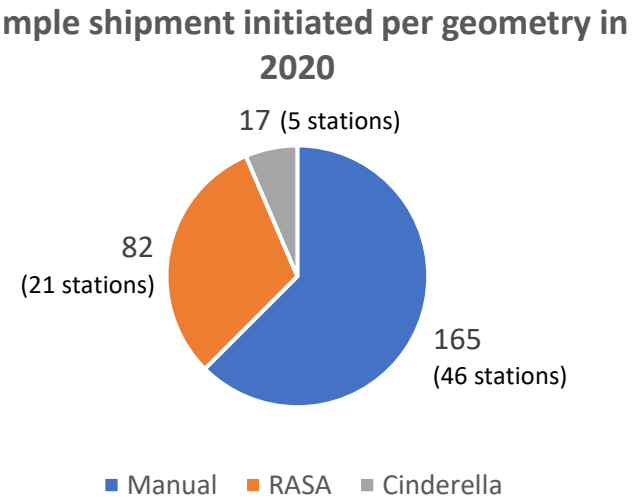
RESULTS

Table 1. Summary of RN Particulate QA/QC samples for 2020
(as of 31 March 2021)

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
N. of sample shipments initiated	69	63	66	66
N. of sample shipments SENT by stations	66	59	64	66
N. of sample shipments received by labs	62	59	64	65
N. of samples analyzed	60	58	63	65
N. of samples NOT SENT (due to COVID-19 restrictions)	4	4	3	3



A total of **264 samples** from IMS particulate stations were requested for re-analysis by RN Laboratories as part of the Network QA/QC Program 2020. Average durations for **Shipping**, **Transport**, and **Analysis** of 2020 QA/QC samples based on sample chain-of-custody records were **13.3 days**, **19.8 days**, and **10.4 days**, respectively.

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RESULTS

Table 2. Average and Median (in brackets) Shipping, Transport, and Analysis Times (in days) of QA/QC samples for 2018 to 2020.

	2018	2019	2020
Shipping	8.1 (3.1)	7.7 (2.4)	**13.3** (**5.0**)
Transport	12.3 (7.0)	13.4 (7.1)	**19.8** (**8.1**)
Analysis	10.0 (9.0)	10.1 (9.5)	10.4 (**8.2**)

Average and median Shipping and Transport Times increased by 72.7% (108%) and 47.8% (14.1%), respectively, in 2020 compared to previous year. **Median Analysis Time for 2020 improved by 13.7%** compared to the previous year despite all the difficulties encountered by the Radionuclide Laboratories.

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RESULTS

A total of 62 Problem Reports were created between 01 January to 31 December 2020 to track the pandemic related issues impacting on the sample shipment, transport, and analysis. Most common factors impacting on the QA/QC program are summarized as follows:

Factors Affecting Sample Shipment	- limited/no international flights - restricted access to station area - no courier services available - limited workforce/resources - other administrative processing delays
Factors Affecting Sample Transport	- shipment quarantine - shipment rerouted - closed borders - limited/no Customs operations - local transport restrictions
Factors Affecting Sample Analysis	- restricted access to laboratories - limited workforce - equipment issues - remote working arrangements

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SUMMARY

- The RN Particulate QA/QC Program 2020 managed to push through despite all challenges encountered
- The success of the implementation of the RN Particulate QA/QC Program 2020 shows the resilience of the CTBTO monitoring system during the COVID-19 pandemic
- Timely communication between various stakeholders were key factors in ensuring continuous implementation of the QA/QC Program amidst current and future global crises