SnT 2025 8 SEPTEMBER ONLINE DAY 9 TO 12 SEPTEMBER AT HOFBURG PALACE, VIENNA & ONLINE
CTBT: SCIENCE AND TECHNOLOGY CONFERENCE

P3.1-415

Wind Noise Reducing System Technical Solutions tailored to the IMS network

Clément Bednarowicz and Maxime Le Maillot

Enviroearth Company

INTRODUCTION AND MAIN RESULTS

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Ensuring IMS station network sustainability is complex across varied environments and risks. Continuous upgrade and improvement work applies to the WNRS, a key element for the quality of the infrasound signal. This approach is based on a need for standardization governed by a solid QA/QC process but also on installation, operation & maintenance feedback related to the product.

This presentation leverages Enviroearth's manufacturer-installer expertise to showcase innovations, studies and challenges tackled with PTS over the last few years.

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Introduction

IMS Infrasound station network consists of 60 stations spread across the globe, each with its own challenges and specific characteristics in terms of environment. The WNRS is a key element in a station's performance and the quality of its data. Enviroearth has been working with the CTBTO for over 12 years to improve and innovate this product, making it increasingly standardized and adapted, with an approach based on experience and continuous improvement.

Latest product Innovations

➔Standardization within the IMS (focus given on WNRS Pipe Array - Rosette - 18m - 96 IP)

➔A piece-by-piece optimization approach focused on three key principles: compliance, practicality, and durability

- Fittings & Nipples : test & research to identify type with optimal tightening
- Accessories : Optimization of bending angle of valve extensions

➔Continuous Development based on a catalog of 16 WNRS models (stainless steel pipe & flexible hoses)

Optimizations in the manufacturing process

➔Quality control governed by ISO9001 (QA/QC) processes)

➔An optimization approach based on prototyping and testing

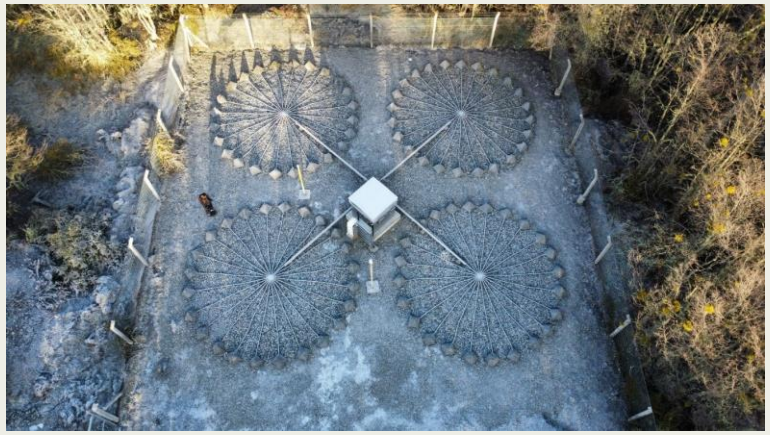
➔Definition of optimal tightening torques for part assembly based on field experience

➔Workshop now equipped with a configurable bending machine (gooseneck

Varied and adapted types of installation

➔WNRS installation designs on demand, based on site assessments & station operations feedback :

- Above ground with large inlet port plate (IS40)
- Flexible hoses on top of platforms (IS02)
- WNRS body additionally covered with gravel (IS05)



WNRS installed at IS02 (Argentina) on platforms and profiles

Studies & Performances

➔Assessment study on WNRS installed systems guided by a comparison of robustness studies for different grades of 304L/316L stainless steel.

Result : Case studies confirm both SS304L & SS316L as durable, corrosion-resistant choices suited to IMS environments & maintenance-free system.

➔Launch of a performance & response study comparison for different types of WNRS (type, size, materials, geometry).

Result: Classification of the most suitable WNRS types for a given application.

Conclusion

A continuous improvement approach, grounded in field feedback, drives robust enhancements that adapt seamlessly to the diverse environments of the IMS network. This constant adaptability ensures WNRS solutions to effectively address varied challenges while validating CTBTO's strategic product choices and methodologies. Together, these strengths reinforce the long-term resilience and performance of IMS stations worldwide.

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