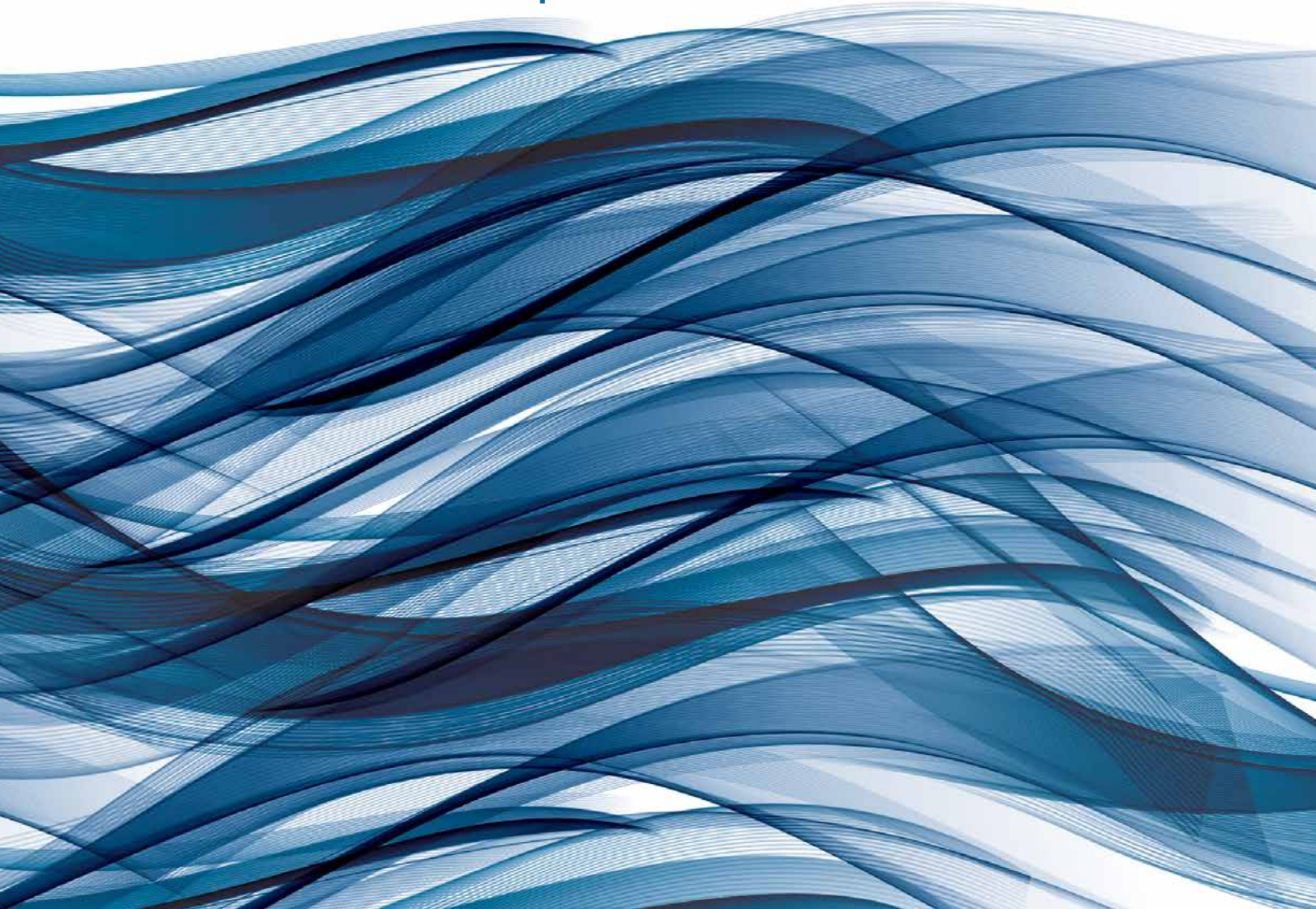




Newsletter #11
December 2019

RANGER

RAdars for lo**NG** distance maritime surveillance**E**
and Search and Rescue ope**R**ations



www.ranger-project.eu

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For more Information

Please visit the RANGER website
www.ranger-project.eu

You can also keep up with more of what is happening at RANGER project by following us on:



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The Project Coordinator



Dear Readers,

Welcome to the eleventh issue of the RANGER newsletter. RANGER is a 44-month European project, co-funded by the European Union's Horizon 2020 research and innovation programme. The consortium comprises 10 partners from 7 countries: a balanced blend of Radar technology industrial organizations, academic/research institutes, high-tech SMEs, and highly relevant end-user organizations. RANGER combines innovative Radar technologies with novel technological solutions for early warning, in view of delivering a surveillance platform offering detection, recognition, identification and tracking of vessels, beyond current radar systems' capabilities, thus drastically improving the response and intervention capacity of European

The current issue is featuring the latest must-read RANGER stories of the past four months (Sept. '19 – Dec. '19) from the first Greek Demonstration Pilot, the Mediterranean Security Event 2019 (MSE2019), the 1st Maritime Situational Awareness Workshop (MSAW), the final Greek Demonstration Pilot, the final RANGER Workshop and the official release of the promotional video that our consortium created from the 2nd French Pilot Demonstration.

Enjoy reading and don't forget to visit our [website](#) for more information!

Project News & Events



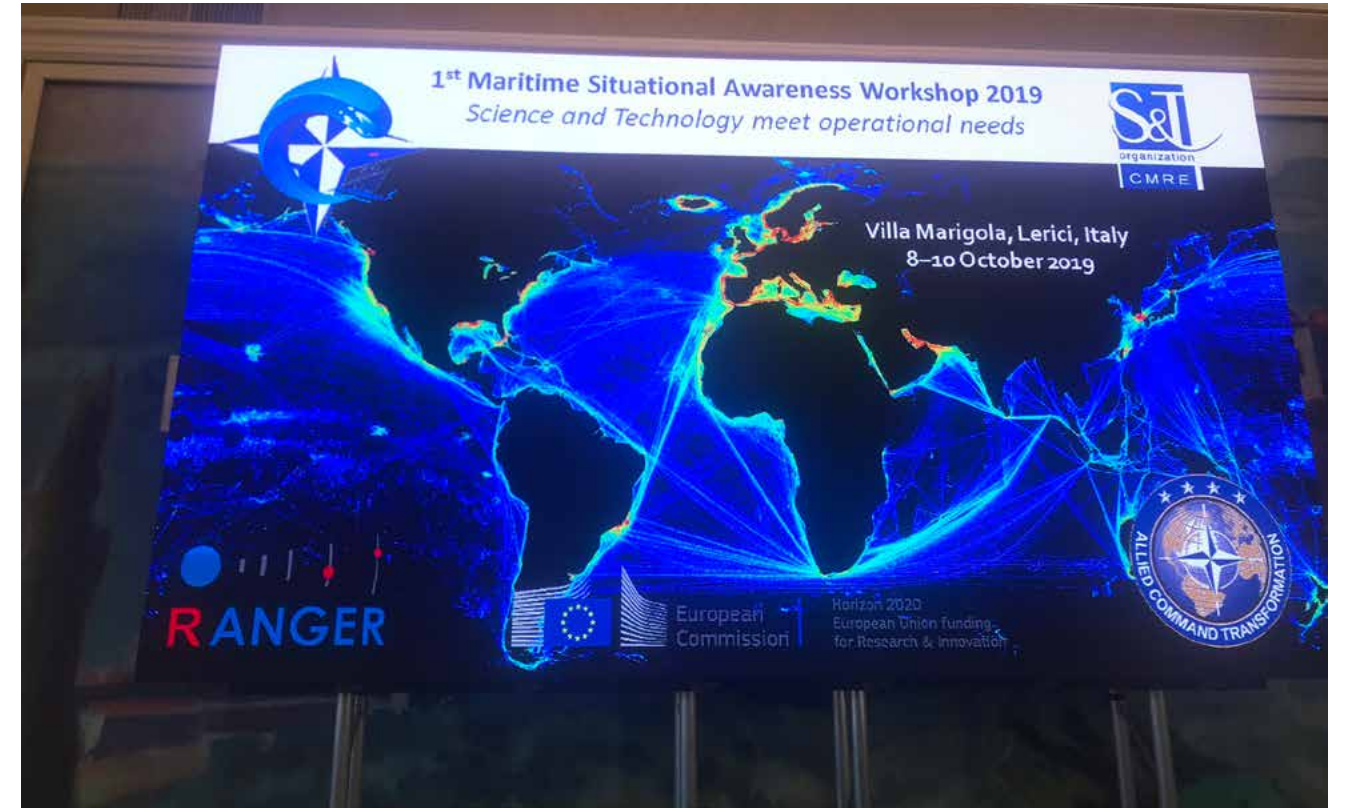
1st Greek Demonstration Pilot

The 1st Greek Demonstration Pilot was held in the island of Crete (Greece) on the 19th of September 2019 in the challenging environment of the Aegean Sea. After a long period of hard work which also included civil works, installations, calibration and fine tuning, the RANGER Platform and the Radars (PE-MIMO and OTH Radar) were integrated and tested for the first time in the Greek territory. With great success were demonstrated:

- ▶ Capabilities of long and short range detection;
- ▶ Continuous tracking of vessels;
- ▶ Data harmonization for interoperable communications;
- ▶ Data fusion of track data such as OTH radar tracks, PE-MIMO tracks, AIS, legacy radar tracks;
- ▶ Machine Learning for outlier and anomaly detection;
- ▶ Early Warnings;
- ▶ Integration with AIS;
- ▶ Integration of legacy radars and Copernicus satellite data;
- ▶ Compatibility with CISE.

Several scenarios with vessels following predefined routes and actions were executed in order to validate the features and performance of RANGER.





1st Maritime Situational Awareness Workshop co-organized by NATO STO-CMRE & RANGER project

The **NATO STO-CMRE** (Science and Technology Organization Centre for Maritime Research and Experimentation) co-organized with our project, **RANGER**, the first **Maritime Situational Awareness Workshop** (MSAW 2019, <https://www.cmre.nato.int/msaw-2019-home>) which was held in the town of **Lerici** in Italy from the **8th to 10th of October 2019**.

The aim of this workshop was to present and discuss advanced, innovative concepts, and emerging scientific challenges with respect to current and future Maritime Situational Awareness (MSA) operational needs. The event themed **"Science and technology meet operational needs"** brought together operational experts and scientists from national government, academia and industry where they had the opportunity to exchange knowledge on respective challenges that they confront on the topic.

Within this framework, the **RANGER project team** actively participated in the fruitful discussions that took place with various maritime stakeholders throughout the workshop and also presented the **RANGER** solutions, the technological advances and its results. Our project presented in total **6 papers** in the MSAW 2019!

In total, during the MSAW event, **42 oral** presentations were made, **12 posters** were showcased along with **7 booth demos** from NITEC and EU projects.



The topics included in the presentations were:

- Big data in the maritime;
- Machine learning in the maritime;
- Signal processing and data fusion;
- Maritime Unmanned Systems;
- Artificial Intelligence in the maritime;
- Support to maritime operation.

The workshop attracted a lot of attention from **experts** involved in the maritime domain with **over 170 ones** participating in who came from **23 different countries worldwide!** Productive collaboration and synergistic discussions among MSA specialists from **technical** and **non-technical** areas was achieved while cross-fertilization of ideas from **scientific** and **other domains** was fostered in order to help in the design and of course implementation of **future solutions** to MSA operational needs.

The presentations and papers are available on-line on the event's webpage <https://www.cmre.nato.int/msaw-2019-home/presentations> and [https://www.cmre.nato.int/msaw2019-papers](https://www.cmre.nato.int/msaw-2019-home/msaw2019-papers), respectively.



Mediterranean Security Event 2019 (MSE2019)

The **Mediterranean Security Event 2019 (MSE2019)**, the largest event of the year on security-oriented areas took place in **Fodele Crete (Greece)** from the **29th to 31st of October 2019** and it was organized by the **community of Security R&D stakeholders** in the European Union. More than **30 EU funded projects** joined their forces and contributed as co-organizers for the successful realization of this event and our project, RANGER, was one of them!

The event was coordinated by **KEMEA** while **EC/DG HOME** and the **Community of Users for Secure, Safe and Resilient Societies** supported its realization.

Its main goal was to bring together all the strategic players of security and civil protection in EU, encourage interaction, synergy and collaboration among stakeholders and foster the development of solutions that can be implemented across Europe and beyond.

During this 3-day event more than **200 attendees** namely experts, scientists, practitioners,

researchers and policy makers had the opportunity to attend keynote speeches, projects presentations, joint workshops and breakout sessions, visit booths and get informed about the latest developments in the field.



Within this context on the 30th of October 2019 (Day 2 of MSE2019), our project coordinator, **Mr. Dimitris Katsaros (EXUS)**, presented the **RANGER innovations** and **project results** for enhanced maritime surveillance in the Border and External security panel. The audience showed strong interest about the solution that our project offers and its next steps. In the course of Day 2, our project team had also the chance to interact and exchange ideas with **MEDEA & ANDROMEDA** projects at the time of participation in the workshop session **"Joint workshop on maritime border security"**.

Throughout the duration of MSE2019, the **RANGER booth** was visited by numerous attendees who were informed around our project.



Final Greek Demonstration Pilot

The successful attainment of the RANGER Final Greek Pilot Demonstration took place in Crete on the 19th of November 2019. The capabilities of long range detection in the challenging area of the Aegean Sea using Over The Horizon (OTH) Radar, as well as the short range detection of small rubber boats using the newly extended photonically enhanced PE-MIMO Radar were presented in the RANGER Advanced User Interface (AUI).

Continuous tracking of several targets, and detection of anomalies and alerts based on pre-defined scenarios followed by vessels provided by the Greek HMOD were demonstrated in real operational environment. The backend systems including the Data Fusion and Machine Learning Module, the Early Warning Engine and the Uniform Communication gateway have been validated once again with great success.

The main achievements in the final Greek pilot demonstration can be summarized as follows:

- Validation of high detection rate, extended tracking range and performance of the OTH radar

even with low EIRP, at long distance and beyond the cluttered island environment

- Validation of the new version of the PE-MIMO radar and short range detection capabilities of 4m rubber boat

- Validation of interoperability, robustness and resilience of the Uniform Communication Gateway (UCG)

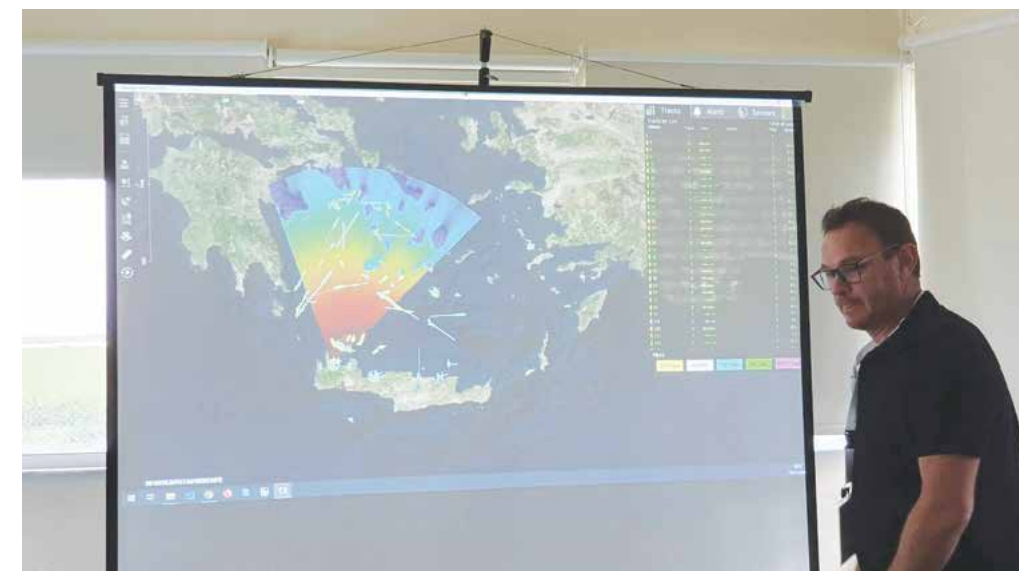
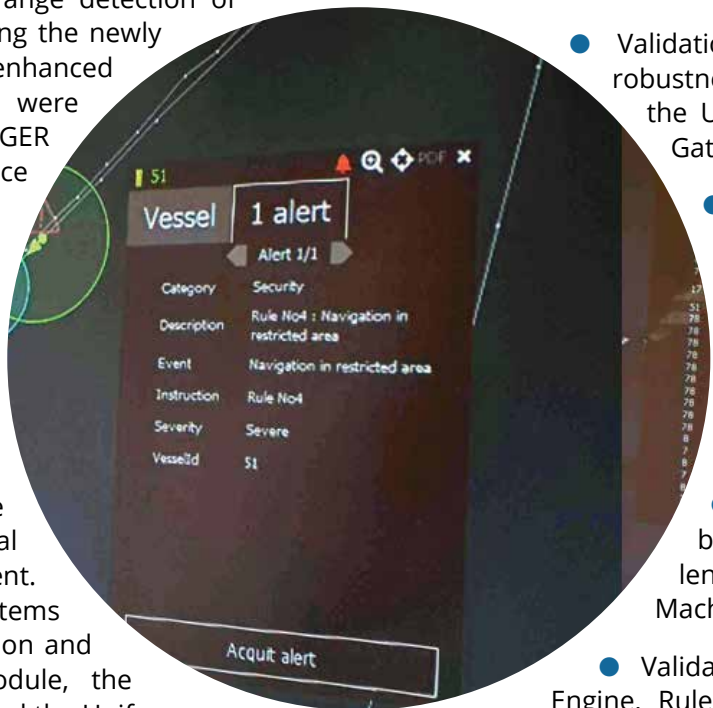
- Enhanced performance of Data Fusion and data association, scalability and processing of large number of input data from multiple heterogeneous sensors

- Validation of unusual behavior and vessel length classification of the Machine Learning module

- Validation of Early Warning Engine, Rule Engine and triggering of different early warnings based on real scenarios

- Enhanced visualization of maritime picture via the Advanced User Interface (AUI)

The advisory board members, external experts and maritime stakeholders as well as stakeholders



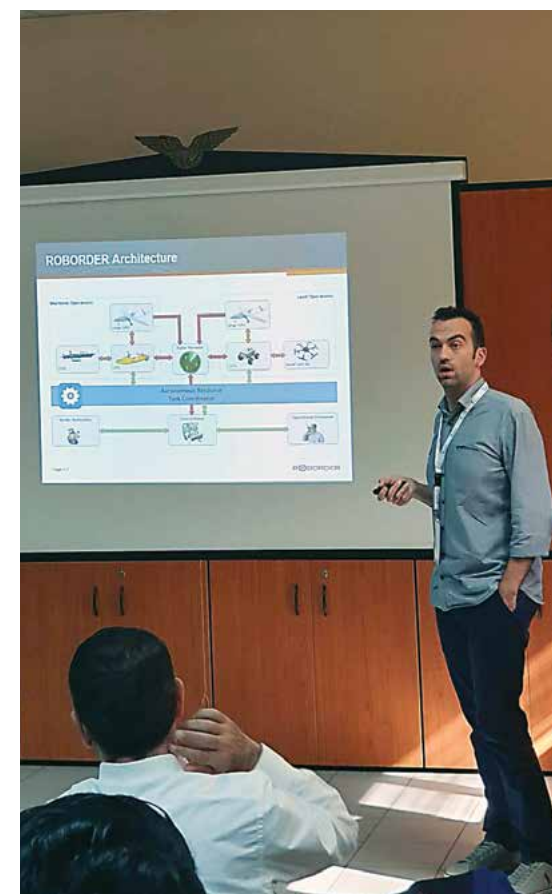
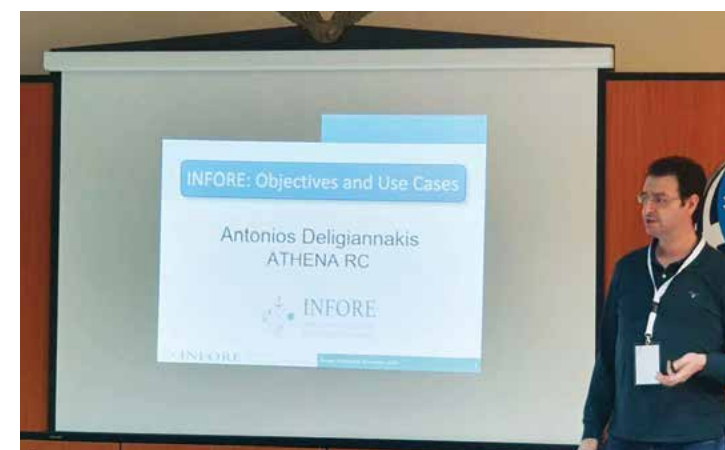
from other EU H2020 funded projects were invited to evaluate the RANGER system capabilities and to provide their recommendations and ideas for future exploitation.



Final RANGER Workshop

The completion of the two French Pilots (2018) and the first Greek pilot demonstration in September 2019, where the capabilities of the platform were tested and discussed, produced promising results and valuable conclusions about RANGER performance and innovations.

On the 20th of November 2019, the RANGER project team organized its Final Workshop in the city Chania in Crete island (Greece) in order to show to stakeholders the results from the trials made throughout the project's duration, the technical achievements and the socio-economic impact of the RANGER solution. In addition, similar solutions developed by other EU funded projects namely ANDROMEDA, MEDEA, CAMELOT, INFORE and ROBORDER were showcased by their representatives and ways for future collaboration in knowledge exchange were examined. The event was attended by 70 experts from NATO, Romanian Border Police, FRONTEX, KEMEA, Albanian General Maritime Directorate, Research Centers and Universities.



RANGER video from the 2nd French Pilot Demonstration

Our consortium created a video from the activities made during the 2nd French Pilot Demonstration in Aix-en-Provence in order to present to the general public the capabilities that the RANGER solution has.

In this context, our partners briefly described about the compliance of the system with the **CISE network** and announced the **integration of RANGER services** in the CISE world. Also, it was announced by **Mr. Dimitris Katsaros (EXUS)** – our project coordinator – that the RANGER is the **1st EU funded project** that is sharing data with the **Greek CISE node** which is offered by the **Hellenic Ministry of Defense**.

The video was officially released in mid-November 2019 and it is available online at the **RANGER website** as well as at its [YouTube channel](#).

You can watch it at:

<https://www.youtube.com/watch?v=RhX7uuyKYFk>

... and spread the word!





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For more Information

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