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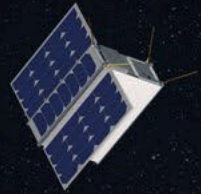
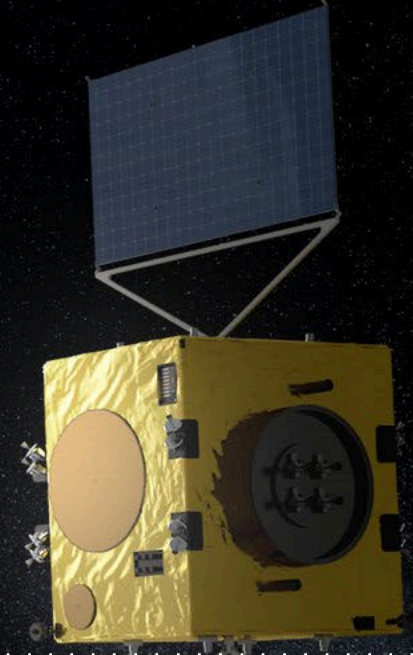


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# Sprint #2 First SMPAG hypothetical threat exercise

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# EXERCISE TASKS

- The **first sprint** will focus on the national organisation and coordination and on defining the lists of tasks to be performed in response to a real threat scenario.
- To harmonise the national (SMPAG-level) efforts into a SMPAG coordinated action this must be organised at communication level, technical level, decision level. The **second sprint** will focus on discussing how the coordination is done among different SMPAG delegations.
- The **third sprint** will deal with communication and coordination issues within SMPAG.

## Task 1 List the required tasks for a coordinated response to the threat.

- A non-complete list of tasks is reported here below as example. It is asked to each delegation to complete this list.
  - Refinement of risk of impact, Improved orbit determination, Trade-off of possible mission architectures and deflection strategies, Selection of the deflection strategy and eventual investigation mission, Perform mission analysis of selected mission, Perform system design of selected mission, Approval at SMPAG-member level of the proposed mission, Others...

## Task 2 List the entities involved at national (SMPAG-member) level for the completion and coordination of these tasks at national (SMPAG-member) level

- List all the different entities involved at national (SMPAG-member) level for the completion of this tasks, describe how the coordination of these tasks is performed at national level.
- Explain which tasks can be performed at national level as there is internal capabilities to perform them and for which tasks there is no internal capabilities.

## Task 3 Explain the internal (SMPAG-member) procedure for performing and advancing the tasks identified at Task 1 at national (SMPAG-member) level

## Task 4 Identify the tasks distribution among SMPAG members for a coordinated NEO response

- The tasks identified in Task 1 need to be coordinated and performed in a collaborative effort at SMPAG level. To this aim this Task will identify the tasks distribution among multiple SMPAG members for a SMPAG NEO response and will discuss how the coordination at the level of SMPAG members is achieved.

## Task 5 Identify data exchange mechanics and formats

- For a fruitful collaboration the data exchange mechanics need to be defined together with the data formats. This task will be completed through a discussion at the SMPAG level.

# SMPAG coordination and communication (Sprint 3/3)



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## Task 6 Define the milestone for inter-SMPAG-member coordination

- Define the milestones during the mission planning and preparation for communication and discussion within SMPAG in a real threat case
  - Define the required milestones for communication and data exchange during the response
  - Define the time schedule and milestones for coordination with other delegations
  - Define the communication channels within SMPAG
  - Define how the coordination with IAWN should be implemented
  - Recall how a decision is taken in SMPAG and propose approaches for ensuring an easy achievement of consensus within SMPAG. For example, the steering group at SMPAG coordination might be performed by the SMPAG chair.

## Task 7 Define the communication lines within a real threat event

This Task will review and consolidate the communication procedure of an impact hazard at SMPAG level, in collaboration with IAWN and communicating such options to member states at COPUOS STSC.

# SMPAG coordination and communication (Sprint 3/3)



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## Task 8 Procedures in case of failures of the deflection action

- This task will define the procedure in case of failure of the first deflection mission achieved through the previous task. This Task will define a back-up procedure if the deflection mission fails including:
  - Asteroid/fragment re-entry coordination
  - National security coordination
  - International security coordination

- According to the “Status report on work package 5.1 from workplan "Recommended criteria and thresholds for action for a potential NEO impact threat", SMPAG-RP-003/1.0, 2018 Oct 18” the criteria for a response to a potential NEO impact threat is
  - Minimum diameter **50 m**
  - **1% impact chance within 50 years**
- For this exercise a synthetic NEO is selected taking a real asteroid **close to the top of the ESA NEO risk** list but with a synthetic magnified higher impact risk: **2021QM1**.
- The diameter is about **50 m**, with possible impact in April 2052. The currently computed impact probability of 1/3322 is **synthetically increased to 1/32**.
- **As for the first sprint the target is not needed as first sprint focuses on procedural aspects only. Therefore more iteration can be done for the target selection**





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# NEXT STEPS

### ■ Task 4

- Integrate the task lists defined by each SMPAG member [Task 1] in [the SMPAG list \[Task 4\]](#)
- Compare and discuss the entities involved at national (SMPAG-member) level for the completion and coordination of these tasks at national (SMPAG-member) level [Task 2] and define the delegation involved in the [SMPAG list of tasks \[Task 4\]](#)
- Compare and discuss the internal (SMPAG-member) procedure for performing and advancing the tasks (already in place or desired) identified at Task 1 at national (SMPAG-member) level [Task 3] and define the procedure for performing them internationally [SMPAG list \[Task 4\]](#)
- For each Task or group of Tasks
  - define Working Groups (WG), WG leader and deputy
  - define participating delegations and activities
  - define timeline
- SMPAG common coordination plan

# Exercise organisation

Sprint 2/3



## ■ Task 5

- Data for exchange of information
- Format of data, e.g. orbits, spacecraft design, orbit determination, analyses
- Architecture support for sharing data,
  - E.g. ESA or NASA SharePoint, UN?
  - Accesses, data etc.

# Exercise organisation



- The SMPAG NEO threat exercise will be performed
  - through **monthly telecons** among participating SMPAG members and
  - through work at the international SMPAG-member level work
  - **Telecon slot: 1<sup>st</sup> Thu of each month starting from 1 May 2023 11 am east standard time**

- The output of the exercise will be a final report containing all the output of Sprint 2/3 on SMPAG collaboration and sprint 3/3 on SMPAG coordination and communication.
- The results of the analysis and the collective analysis of each delegation will be coordinated in a unique presentation at SMPAG meeting in Oct 2023.
- The resulting report and presentation could form a conference paper for information under NEO agenda item of the Scientific and Technical Subcommittee of COPUOS.



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## First SMPAG NEO threat exercise

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