EMPIR Reporting Guidelines

Part 6 – Preparing for Mid-Term Reviews

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If you require further help or guidance after reading this document, please contact the helpline

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1 Background

For JRPs (not for SIPs), a mid-term review meeting is held to supplement the previous documentary based reviews[1]. For each TP, all of the JRPs will be reviewed at a high level by a group of external experts who will be selected by the TP-Guardians and by the members of the EMPIR Committee.

They will evaluate the potential outcomes of the projects and their uptake by stakeholders by addressing the following questions:

- Is the project going to meet the needs of the stakeholders?
- How have the stakeholders' needs changed in the 3 years since the PRTs were submitted?
- Should changes be made to a project to ensure impact is maximised?

The review can then be aggregated at TP level to make a judgement on how well the portfolio of projects will meet the intentions in the scope for the call. The mid-term TP reviews will not be about individual project progress against the plan as this is already assessed by the EURAMET-MSU during the reporting process. In order to facilitate the mid-term TP review process JRP representatives will need to complete Reporting Template 5 - JRP Self-Assessment for the Mid-Term Review (http://msu.euramet.org/downloads/#reporting) and prepare a presentation. These reports will be requested by the EURAMET-MSU. **Note that it is particularly important that the JRP website is updated before the mid-term review as reviewers will use this as evidence of publications and other dissemination activities.**

JRP representatives will be informed about the date, location and format of the mid-term TP review meeting by the EURAMET-MSU. The one day meeting will likely be held at an NMI/DI. Attendees will include the external experts (~5), the JRP representatives, the EURAMET-MSU and may include the TP-Guardian and the TP-Coordinator. Reviewers will be provided with each JRP's Publishable Summary, Self-Assessment and draft presentation. Guests from the senior management of nearby NMI/DIs will also be encouraged to attend the initial presentations to get a wider view of the projects beyond the involvement of their own staff. The mid-term TP review meeting will include presentations by each JRP representative and a joint Q&A session for all participants. A structure for the presentation is given in Section 3. JRP representatives are requested to follow this structure as closely as possible in their presentations. The external experts will express their opinion about these achievements and will make recommendations on the improvements that should be made in their final written report.

Following on from the outcomes of the mid-term review, the EMPIR Committee will decide whether the recommendations should be followed-up either by the EURAMET-MSU through the normal reporting process or whether the TP-Guardian should also be involved. When a suitable solution is agreed (e.g. stop a work package, redefine activities / deliverables, removal / addition of a partner) the coordinator may need to liaise with EURAMET in order to implement an amendment of the EMPIR Grant Agreement. It is also possible that the EMPIR Committee will raise other general issues about the TP to be addressed by the TP-Guardians.

[1] Note that projects of shorter duration, e.g. 24 months, will be reviewed near the end of the projects rather than at their mid-term.

	TP-Guardian	TP-Coordinator
14IND	Jiri Tesar (CMI)	Andy Blackmore (NPL)
14RPT	Miruna Dobre (SMD)	Tanasko Tasic (EURAMET)
15HLT	Beat Jeckelmann (METAS)	Sophie Vaslin-Reimann (LNE)
15SIB	Erkki Ikkonen (VTT)	Ian Severn (NPL)
15NRM	Maguelonne Chambon (LNE)	Eveline Domini (LNE)
15RPT	Miruna Dobre (SMD)	Tanasko Tasic (EURAMET)
16ENG	Albert Dalhuijsen (VSL)	Silvie Hoffmanová (CMI)
16ENV	Jörn Stenger (PTB)	Béatrice Lalere (LNE)
16NRM	Maguelonne Chambon (LNE)	Eveline Domini (LNE)
16RPT	Miruna Dobre (SMD)	Tanasko Tasic (EURAMET)

2 The self-assessment

The EURAMET-MSU provides a template - Reporting Template 5 - JRP Self-Assessment for the Mid-Term Review which shall be completed according to your consortium's assessment of the project and sent to the EURAMET-MSU to be provided to the external experts before the review meeting.

Please note that the reviewers do not have the Annex 1 of your project, so the self-assessment should be a stand-alone document.

2.1 Introduction

What are the key existing capabilities and knowledge of your consortium?

How will these be enhanced by this project?

What will these enhancements enable your partners to do in the future in terms of new products or services to their customers?

Please complete the 'Introduction' as shown in the example below:

Example

1 Introduction

The partners bring together some of the best national measurement capabilities in the world in the area of high-frequency electronic/electromagnetic measurement and two commercial organisations. Some of these capabilities (partner A and partner B) cover very broad areas of the technology and have they been built up over many years. Partner C and partner D have also been involved in this area for many years, but provide a narrower scope to the capability. The capabilities of partner E and partner F are relatively new but they have improved considerably in a relatively short period of time. The knowledge and expertise of the consortium is at a very high level, particularly amongst the NMI partners that have worked in this area for a long period of time.

All partners are increasing their appreciation of the issues affecting this area of metrology and are developing a deeper insight into each other's knowledge and capabilities. All organisations are getting a stronger feel for how difficult it is to

apply leading edge metrology research in an industrial environment and how the different research strengths of the consortium can be combined to deliver solutions.

The enhancements to these capabilities, brought about by the work undertaken in this project, are enabling the NMI partners to establish and provide traceability in new areas of measurement (i.e. for new measurands and existing measurands being provided over extended frequency ranges). In addition, new forms of traceability are being made available using the very latest technologies. These enhancements are also opening up new opportunities for further collaboration with the wider scientific community through research programmes such as Horizon 2020.

2.2 Strengths and weaknesses

2.2.1 Objective indicators

The objective indicators are already detailed in your publishable summary or output and impact report. Insert the numbers in the table and assess your position in these areas relative to other JRPs in the TP.

2.2.2 Excellence

With a view towards the end of your project, what do you consider are the strengths and weaknesses regarding the scientific or technological excellence of your project's work?

Focus on 3 strengths and 2 weaknesses and compare your consortium contribution with that from other regions (SIM, APMP, etc.).

Please rate your project using the following scale and explain your self-assessment.

(9) Dominant: The consortium is recognised internationally - setting the pace and direction of metrology in this area worldwide.

(8) Strong/dominant

(7) Strong: The consortium is recognised internationally - not the leading entity, but able to set new directions on its own.

(6) Favourable/strong

(5) Favourable: The consortium operates mostly as its individual national identities - leading at national level and able to sustain technological competitiveness.

(4) Tenable/favourable

(3) Tenable: The consortium operates only as its individual national identities - not leading and unable to set an independent course.

(2) Weak/tenable

(1) Weak: The consortium is unknown beyond Europe and its scientific contributions lag behind other regions.

2.2.3 Impact

Elaborate which, and how, the organisations (partners, external stakeholders) will profit from the project outputs.

Describe how your project is engaging with stakeholders to facilitate the transfer of project outputs to those organisations and how this will maximise the early impact of your project.

Indicate the impacts that you expect to be achieved by the project. Take a perspective of 5 years after the end of the project and focus on a maximum of 5 impacts.

Please rate your project using the following scale and explain your self-assessment.

(4) High: Evidence for economic and societal impact, showing important influence on economic growth, environmental issues, public health, healthcare, or health policy.

(3) Substantial: Evidence for economic and societal impact, as a pronounced result of the research.

(2) Moderate: Evidence for economic and societal impact, but this is not a pronounced result of the research.

(1) Weak: No or unclear evidence of economic or societal impact.

2.2.4 Implementation

Strengths and Weaknesses

Outline the strengths and weaknesses of your consortium in implementing the project's tasks and in achieving the envisaged outputs.

Specify strengths or weaknesses of distinct partners (e.g. in terms of scientific/technological capabilities, motivation and ambition, project management experience, or leveraging the potential impact, etc.).

Issues and deviations

Please summarise (in one or two paragraphs) the deviations from your initial project plan and elaborate on the issues and corrective actions which you consider will be necessary for the remaining project duration.

Cooperation and joint research

Is the cooperation between the partners effective and up to the standards required for a successful project? Highlight any partners whose contribution is not as required.

Please describe if the joint research is leading to results that individual NMI's could not achieve by themselves. Also describe how this is leading to added value for the metrology and wider communities.

Please complete the 'Strengths and Weaknesses' as shown in the example below.

Example

2 Strengths and Weaknesses

2.1 Objective indicators

Indicator		Total	Poor	Unsatisfactory	Satisfactory	Good	Excellent
Engagement outside the metrology community	Number of external partners	4				√	
	Number of unfunded partners	2				√	
	Number of collaborators[1]	13					√
Presentations & other dissemination	Conference presentations /posters	26					√
	Other dissemination activities	4			√		
Peer-reviewed publications	Peer-reviewed publications	3			√		
	Co-authored peer-reviewed publications[2] (of the above)	0		√			

Indicator		Total	Poor	Unsatisfactory	Satisfactory	Good	Excellent
Standards	Inputs to standards committees[3]	9					√
	No. of unique standards committees engaged with (of the above)	7					√
Training	Training activities (internal)	4				√	
	Training activities (external)	1			√		
IP	Patent applications	0			√		
Uptake	Uptake/use of project outputs by the end-users	2				√	

[1] - Collaborators are those organisations that have signed a Letter of Agreement with the consortium.
[2] - More than 1 partner.
[3] - Committees whose main task is to draft documentary standards – not metrology committees.

2.2 Excellence

The main strengths regarding the scientific and technological excellence of this project are the skills, experience and expertise of the scientists, at the NMIs and unfunded partners. The combined resources of the consortium provide a best-in-the-world knowledge base and this is being exploited in the project to deliver work of a very high standard. In addition, the consortium is working towards the early uptake of the project outputs by the end-users.

Weaknesses within the consortium are the lack of expertise of the smaller NMIs and a few technical delays encountered by these partners, which resulted from equipment and personnel issues.

Strength 1: Knowledge and expertise among the consortium scientists in the topic area of this project

It is considered that the knowledge and expertise within this consortium as a whole exceeds that of any related consortium/activity in other regions.

Strength 2: Combined facilities and resources available at the consortium sites

It is considered that the combined facilities and resources available at the consortium facilities are only rivalled, in one or two areas, by facilities available at NIST, USA. For all other areas of the project, the combined consortium facilities exceed facilities found in other regions.

Strength 3: Science deliverables which work for the customer, not just the NMI

Some of the project's scientific activities are designed for immediate non-NMI use and are being demonstrated outside the NMI community. A measurement method and a residual error model are already in use by one stakeholder.

Weakness 1: Lack of experience within some consortium NMIs

Although two of the partners lack the experience of other partners, such a situation is very common in other regions (e.g. APMP). This apparent 'weakness' is therefore considered not to be any greater than that found in other regions.

Weakness 2: Overcoming delays

Some deliverables have encountered delays due to technical and/or personnel problems, but these have been or are being solved. A key member of the staff has left partner E and the organisation had to appoint a replacement, which led to a delay in the layout design for reference PCBs. Technical issues with the 4-port VNA led to a delay in the multi-port measurements. The issue has been discussed at the project meeting and partner C invited partner E to receive training and carry out the measurements using partner C's equipment at their facilities.

Based on the above indicators, the overall self-assessment rating for this JRP is given as **(8) Strong/dominant**. The consortium is dominated by two larger NMIs (partner A and partner B); if the consortium was more evenly matched it could be ranked higher, however the relative lack of experience of some partners make this difficult to achieve.

2.3 Impact

All partners are benefiting from the project outputs. The participating NMIs are increasing both their measurement service capability (for third-party customer calibration services) and their ability to contribute as collaborators in other research programmes (such as Horizon 2020). In addition, the unfunded partners (commercial organisations) are benefiting through quick and easy access to the knowledge generated by the JRP outputs. The external stakeholder community (European industry and research organisations, such as universities) are also benefiting from the JRP outputs – easily accessible traceability mechanisms enable efficient and reliable testing of new products (in industry) and research into new areas of science and technology (in academia).

The project has established a Stakeholder Advisory Group which progressively gives feedback on the relevance of the different methods developed during the lifetime of the project to create the highest possible impact. The outputs of the project have been disseminated to European manufacturers of VNAs, calibration kits, precision connectors and waveguide components via presentations given at relevant conferences and meetings arranged at the stakeholders' facilities. Two of the project outputs (a measurement method and a residual error model) are already in use by one European stakeholder.

Some expected impacts from this project during the coming 5 years are as follows:

- Availability of primary national standard traceability across the entire millimetre-wave region (30 GHz to 300 GHz)
- Routine calibration services for Vector Network Analyser (VNA) Electronic Calibration Units
- Routine calibration services for multi-port devices, including devices on high-speed Printed Circuit Boards (PCBs)
- Accessible traceability, via verification artefacts, for nonlinear and extreme impedances
- Up-to-date 'quality-related' documentation – (i) the EURAMET VNA Guide; (ii) IEEE standards for waveguide and coaxial lines

Based on the above 'Impact' indicators and expected impacts, the overall self-assessment rating for this JRP is given as: "**(3) Substantial**: Evidence for economic and societal impact, as a pronounced result of the research".

2.4 Implementation

Strengths and Weaknesses

The partners have shown a high level of engagement which has ensured that the project's tasks have been delivered to a very high standard of quality and efficiency. All participants work well together and there have been no management issues to solve. Partner C has offered (unplanned) training and access to their equipment to partner E so that the multi-port measurements were not delayed for longer. Partner B is very experienced in dissemination and outreach activities and has been very active in the engagement of stakeholders.

The cooperation between participants still requires improvement. The scheduling of the activities for the second half of the project is envisaged to promote the joint research and collaboration. The improved collaboration will be reflected in the planned co-authored peer-reviewed publications. The capabilities of partner E and partner F have improved considerably in a relatively short period of time but are still relatively new.

Issues and deviations

There was a technical issue with the 4-port VNA at the facilities of partner E which led to a significant delay in the multi-port measurements and the establishment of uncertainty budgets. Partner C has offered their assistance and training and we believe that we will still be able to undertake an intercomparison of full and quick calibration schemes during the lifetime of the project, which was one of our key scientific and technical objectives.

The industrial partners and the stakeholder committee often find it difficult to attend the face-to-face project meetings. This is often due to internal restrictions of the companies. For this reason, it has been decided to hold the stakeholder committee meetings via teleconference, even if this is not ideal.

Cooperation and joint research

The cooperation between partners will increase in the second half of the project when sharing of equipment and data will be central to many activities. In the first 18 months, partner C has offered partner E unplanned training and access to their facilities.

The activities planned for the first half of the project did not involve much joint research. However, the partners have exchanged knowledge about characterisation measurements and PCB components. Such exchange of knowledge has led to results that could not have been achieved by a single NMI. For example, the advice from partner D has been very helpful in overall improvements to designs for PCB components being realised by partner E. Also, during the first 18 months, partners A, C and D have started to revise a EURAMET Guide for VNAs.

2.3 Opportunities and Threats

Elaborate on the main opportunities and threats you see for the successful exploitation of the project outputs. Indicate how to avoid/limit/minimise the threats and leverage/enhance/maximise the opportunities.

State how your project depends on the actions of the partners and/or external stakeholders beyond the contract to achieve the results.

Which decisions need to be taken and by whom to ensure that results are taken up?

Please complete the 'Opportunities and Threats' as shown in the example below:

Example

3 Opportunities and Threats

The main opportunities and threats for the successful exploitation of the project outputs are summarised below:

Opportunities

- Interactions with professional societies (such as IEEE, EuMA, etc) – this includes participation in the organisation of international scientific conferences in this area of technology, as well as workshops, seminars, training courses, etc. Active representation on appropriate technical committees with such societies is enhancing these opportunities;
- Links to regional metrology organisations (EURAMET, AMPM, etc) – this ensures the established new and improved traceability mechanisms are receiving public exposure to the relevant user communities (in Europe and elsewhere). Active representation on appropriate EURAMET, BIPM, etc, technical committees is helping leverage these opportunities;
- Continuation of the European ANAMET Technology Forum meetings – this will enable knowledge exchange within the European region (including those from outside the consortium) to be continued. This should be achieved through self-funding mechanisms (modest meeting registration fees, etc);

Threats

- Lack of a formalised project framework (beyond this project) could mean that best intentions for future exploitation of the project outputs could become dissipated and/or deployed elsewhere. This threat could be minimised by obtaining some form of follow-on (i.e. maintenance) funding;
- NMIs subsequently prioritising other areas of science and technology could limit the longer term sustainability of successful exploitation of the project outputs. This threat could also be minimised by obtaining some form of follow-on (i.e. maintenance) funding.

This project depends on the long term commitment (beyond the lifetime of the project) of all the partners to maintain, and even further develop as appropriate, all capabilities that are being established by outputs from this project. Established partnerships with external stakeholders ensure the continued relevance and applicability of the outputs from the project.

Decisions on appropriate long-term funding and resource allocations need to be taken by the managements of the participating NMIs, the relevant Technical/Consultative Committees within EURAMET and BIPM, and end-user groups in industry in order to ensure appropriate take-up of results. Again, the maintenance and development groups could be instrumental in such a long-term plan for the take-up of results by industry and for the maximum impact.

2.4 Summary

To summarise, please give the headlines of what you want to have achieved at the end of the project and how you expect your partners and stakeholders to make use of that achievement in the 5 years following the end of the project.

What will make your project a success?

What will remain from your work?

Please complete the 'Summary' as shown in the example below:

Example

4 Summary

The key targets to be reached by the end of this project (and to be exploited in the 5 years that follow the end of the project) are as follows:

- New SI traceability for measurement quantities used in high-frequency electronics applications. This new traceability will enable end-users to exploit frequency regions with the confidence that comes from having the availability of traceable measurements.
- New customer calibration services for new types of measurement and new types of device. These new calibration services will allow users of 'new' measurands (such as X-parameters) and new devices (ECUs) to quantify quality attributes such as traceability, measurement equivalence and reproducibility, etc.
- A knowledge resource (i.e. source of European expertise) for those using and requiring state-of-the-art measurements for applications in production, manufacturing, testing, research and development. This knowledge base will be accessible and deployable in future research and development projects and initiatives supported by funding mechanisms such as Horizon 2020.

This JRP will therefore be considered a success if these targets are met and the long term aspirations (for continued traceability and measurement services) are sustained. It will be these services and capabilities that will remain beyond the lifetime of this JRP (for a period of at least 10 years or more).

3 The Presentation

The EURAMET-MSU provides a structure for the presentation to be given at the mid-term review meeting. The presentation shall be sent to the EURAMET-MSU prior to the meeting.

The presentation is aimed at supporting the claims made in your self-assessment, more specifically the Technology Position and Impact score. It shall include one or two overview slides and it will then focus on the project's objectives, achievements and **justification for the Technology Position and Impact score**.

The **timetable is very tight** and you will be asked to stop once your time is over. The EURAMET-MSU will inform you of the duration of the slot for the day. You should carefully consider how to get your key messages across in the time available.

The presentation should be in PowerPoint and should follow the suggested outline below:

- Title: 1 slide
- Introduction: 1 or 2 slides
- Objectives: 1 or 2 slides
- Achievements: 2 to 4 slides
- Technology position score: 1 or 2 slides
- Impact score: 1 or 2 slides
- Summary: 1 slide