

What makes a good technical report?

The ASME description: A technical report should be clear, concise, and complete, with assumptions plainly identified and data presented (including their uncertainty) with precise logic, with relevance to practices described, and with actual accomplishments of the work clearly stated and honestly appraised. It should be technically sound and free from personalities and commercial bias (whenever possible).

In my view¹, a technical report (included theses, dissertation, journal papers and ppp presentations) should be

- *interesting*
- with a *clear narrative* from the introduction, through the work carried out to a clear expression of substantial conclusions and recommendations
- of *sufficient significance* and *relevance* to the professional community that it will be referred to and used by other workers in the field.

All of the above are required, i.e. a report must be interesting, well written, relevant and significant.

The requirement that the tech report be **interesting** means that

- Someone has an interest in you performing the work (and preparing the report) and that quite a few people would want to read it to gain knowledge and to use this knowledge (establish a practice).

A **clear narrative** means that

- there is an introduction that places the topic in the broader context as well as in the specific context (general usage and particulars or specifics of application).
- there is a clear description of experimental/computational/theoretical techniques
- care has been taken in choosing which results are presented
- there is a thorough analysis (mathematics) and a thorough discussion of all of the results
- there are explicit and substantial conclusions and recommendations and that these are based on the analysis and discussion
- the references are appropriate in number and are properly selected
- there is a clear and strong development of ideas as the reader progresses through the report
- the report is free from the poor use of English and typographical errors

That the report is **significant and relevant** requires that

- it contains (just) enough information to allow others to **reproduce** or **verify** the work independently²
- the accuracies of experimental/computational/theoretical techniques are sufficient for the purpose of the report
- there are explicit conclusions and/or recommendations and that these can be used to develop or create new ideas, tools, processes or products

¹ Condensed and edited from a document prepared for IGTI by the Chairs of various technical committees (May 2006). Luis San Andrés, Chairman Structures & Dynamics Committee. <http://www.asmeconferences.org/TE10/pdfs/QualityReviewGuidelines.pdf> Global Gas Turbine News, Vol. 48, No.1, February 2008 (<http://files.asme.org/IGTI/News/14860.pdf>)

² The need of industry to protect its intellectual property must be carefully assessed.

- it makes a step forward in the “state of the art, ” that is to advance the current knowledge of the topic scrutinized.
- it will be referred to by other workers in the field for some years to come, it will be used by colleagues or other engineers as established practice in your workplace.

The better reports often, but not always, provide novel physical insight into results obtained by a synergy of experiments, computation and theoretical analyses. These reports then present those results in a way that is useful not only to the specialists in the field but also to a much wider audience.

A technical report is **unacceptable or useless** if it

- does not advance the knowledge, or/and
- is technically incorrect
- does not contain sufficient new ideas, methods, confirmations of ideas, techniques or results (that is it merely prints test results that others have done before).
- fails to give sufficient information, either in the main body or by references, to allow the results or concepts to be reproduced
- is disorganised or presented badly
- contains too few or too many references
- is merely a work-in-progress
- will not be referred to by other workers in the field
- has an inappropriate selection of material
- has insufficient descriptions, analyses or interpretations of each figure
- has little or no insight
- does not contain explicit and useful conclusions and/or recommendations (this is not the same as a summary)
- is not interesting

In terms of the **narrative and correctness**, when writing preparing the report **consider the following**

- What is the purpose of the report?
- Is the presentation satisfactory? Is it well organised?
- Is the report of an appropriate length? Is it clear and concise?
- Is there an appropriate introduction?
- Is the selection of material appropriate?
- Is there validation of any theory or computational method?
- Is the experimental accuracy assessed (uncertainty)?
- Is the method of approach valid?
- Is it technically correct?
- Are the figures and tables appropriate? Are the figures and tables clear? Are there too many figures or tables?
- Is there sufficient analysis and interpretation of each figure?
- Are the conclusions drawn from the results? Are there any conclusions or is there just a summary?
- Are the references appropriate?
- Is the use of English satisfactory?