Quality Times

Celebrating 40 Years TRIUMF

We want to hear from you on this issue.
qualitytimes@triumf.ca

TRIUMF
4004 Wesbrook Mall,
Vancouver, BC
V6T 2A3

Tel. 604 222-1047
Fax. 604 222-1074

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Quality Help

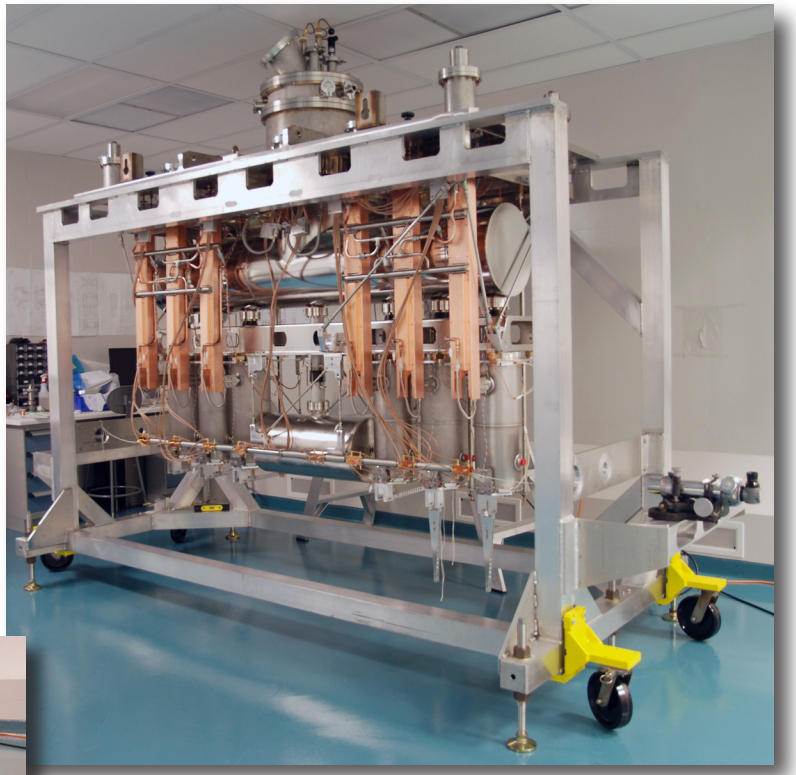
Some say it is hard to find good help but fortunately at TRIUMF we have lots to choose from.

The QMS Leaders are happy to announce they are being joined by the following people: Mike Adam, Friedhelm Ames, Stu Austen, Randy Churchman, Brian Hagen, Conny Hoehr, Fred Jones, Mike Laverty, Phil Levy, Joe Mildenberger, Rod Nussbaumer, Chris Ohlmann, Doug Preddy, Anne Trudel, Pat Walden, and Geoff Wight. *by Ken Buckley*

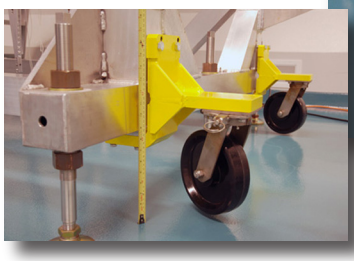
Requirements à la cart

We have all seen it, a truck wedged under an overpass.

The most interesting thing about this event is not that we weren't at highway speed when it was discovered, but why it happened at all.



Those involved in the design of the cart all knew about the doorway. We knew what the cart had to move, and from where to where. In fact, we were so sure about it that we had no need to write the following requirement: "The cart with its cargo in place shall not exceed a height of 2.1m." Emboldened by our shared knowledge, we also assumed that someone else had considered the



unwritten requirement to fit through the doorway, when checking the drawings.

The solution was to design, build, and install offset wheels to lower the cart enough to get through the door. Recall this was a clean-room doorway, so the solution of enlarging the doorway was not practical. The cost? A week of scrambling and nearly three person-weeks of effort. That's effort that could have been spent on your project.

In dining terms (you were wondering when that would come up) the lesson is a "trou normand"; a refresher course to remind us of the importance of a requirements specification (written requirements) and human nature. *by Remy Dawson*

Understanding the Engineering Design, Manufacture, and Assembly TSOP

You, like others, may have read a TSOP and said to yourself "What the heck does that mean?"

To help answer that question let's go through the Engineering TSOP. Go to docushare, open up the TSOP, and follow along.

We come first to Purpose and Scope. These processes define how anything gets designed or made at TRIUMF and apply to all groups who do design, manufacturing, or assembly work. They apply when this work is used in support of licensed activities, that is if anything you are doing will be part of the TRIUMF beam delivery facilities (500 MeV, TR13, ATG cyclotrons, & ISAC) or be used in a radioactive area. The QMS panel thinks you should simply assume this means all design, manufacturing, or assembly activities. Why would you be doing any work that should not be done efficiently and to some known quality standard?

Next we come to Responsibility. The Division Head is responsible for ensuring activities in their division follow what is described in the TSOP. The specific responsibility (assessing, reviewing, recording, etc.) is held by whomever each group has designated to hold that authority as stated in their group manual, typically the group leader. (Apropos of nothing in this article, I still have $20 left for the 63rd different person to email Quality Times with the subject "a reader".)

The first process is Planning. Each group receives requests for it to do some work. This may be a verbal request or be formalized. An assessment of the implications, the hazards, the scope, the feasibility, and the completeness and clarity of the requirements of what is requested is made and recorded. If the scope of work involves other groups, the group leaders have to agree on partitioning the work into group-specific work packages. If there is a hazard that the group has not dealt with before then there is a safety review. It is the responsibility of the Division Head of the person requesting the work to hold this safety review. Note that this safety review does not necessarily allow you to operate whatever is made but ensures there is a solution for new hazards. Lastly the work is assigned to a competent person and recorded.

"The design review is intended to determine whether the proposed design will satisfy the requirements specified."

After Planning we come to Design. Design development is the production of a conceptual design. The design review is to determine whether the proposed design will satisfy all the requirements specified. This is not a review of the detailed design. Any risk with the design performance is assessed and a decision can be made to proceed, alter the design, gather more information, or change the requirements. This review is only as good as the stated requirements. Once the concept is accepted then detailed design begins. The review of the final design outputs is done under the Documents and Record Management TSOP.

After Design comes Manufacturing which follows a similar process to Planning. The specifications (e.g. machine shop drawings) are assessed to ensure that it is possible to meet the requirements stated in the specifications, whether exceptional inspections are requested, and whether any hazards exist in the manufacturing process. Once manufactured the product is inspected against the specification. If it does not meet the specification a decision is required whether to correct, accept as is, accept for a different scope of use, or discard the product. If the product is discarded a decision is made whether to try to manufacture it again, change the design, or abandon the whole exercise. In any case where the original specification is not met directly or after correction, a record of disposition is kept. The purpose of this record is to identify any limitations that may exist with a design, or with manufacturing a particular design, and be able to decide if and how to correct them. This adds to our body of knowledge. Note that only the requestor can approve any outcome other than correcting the part.

The last process is Assembly and since it is essentially identical to the Manufacturing process the same explanations apply.

The last comment I would like to make is about record keeping. If you do not currently have a process in place one way to keep the required records is to have regular group meetings where these requests are discussed and minutes are kept. The QMS Implementation Panel is looking at providing a site wide work request system that would take care of generating the necessary records and provide a common mechanism for requesting work of any group. *by Ken Buckley*