From: M. Harry

To: Statistics Advisory Board Distribution

Subj: Recommendations and Inputs to GEG 5-Year Strategic Plan

Date: May 19,1989

As a first order of business, I would like to personally thank each of you for participation on the GEG Statistics Advisory Board. As you know, the purpose of the SAB is to provide technical leadership and direction to the GEG community. As indicated during our first meeting, we will focus our primary efforts on the formulation and submission of recommendations to the Quality, Manufacturing, and Material Policy Boards. Of course, the recommendations will be concerned with the application of statistical strategies and procedures in support of key organizational initiatives, policies, and practices; e.g., Six Sigma, Cycle Time Management, Process Characterization, etc.

As discussed, our first task is to prepare a "roadmap" to address the status, inter-relationships, and milestones of the major statistical activities which will support the 1989 GEG 5-Year Strategic Functional Plan. In turn, the roadmap will be used as a functional planning tool by the Directors of Group Quality, Manufacturing, and Material. The following elements must be present in the roadmap[1]:

- Specific statements of what is currently going on and how those activities interface with the high-leverage initiatives. What activities are close to completion and which ones will be continuing.

- Specific statements of what needs to happen in the future. When it should happen. What it will take to make it happen; e.g., research, resources, training, etc. What benefits will be gained. How the customer will benefit. How value will be added to the product.

- Key, high-leverage initiatives which involve the direct or indirect application of statistics include; a) process characterization, b) in-house statistical process control, c) supplier SPC, d) design for manufacturability, and e) process and part standardization.

As a partial example of what is required, let us set up a simple scenario. Let us imagine that we have just finished considering our task where "Design for Manufacturability" is concerned. As we are all well aware, this initiative involves the design of product in accordance to existing manufacturing, material, and component capability data. Obviously, this initiative crosses over into the process characterization and supplier SPC initiatives. The following issues and concerns were surfaced during the hypothetical "brainstorming" meeting:

---

[1] An example roadmap has been attached for review purposes.

• The research and development of statistically based design tools (all design disciplines) must occur by Q2-90 in order to meet the Motorola Inc. goals by 1992. The application of such tools represents the following potential benefits:

- Improved parameter performance
- Lower costs
- Improved reliability
- Less complex products and processes

• Currently, the mechanical community has several Six Sigma design tools available; e.g., the MTEC "Six Sigma Mechanical Design Tolerancing" course and optimization software. However, such "discipline specific" tools are generally not available to the analog and digital design communities. In addition, the software and process design communities are suffering from the same problem. This situation must be remedied if we are truly going to "design for producibility."

• Regardless of form, the design tools, in one way or another, will have to "feed" off of capability data. Obviously, if one must feed data to a tool for subsequent operation, the data must be drawn from some base; e.g., handbook, computer data base, etc. In order to effectively specify what types and forms of manufacturing and vendor capability data bases are required, the tools must first be in existence; otherwise, it is highly likely that a data/tool mismatch will result. GEG has already started the development of data bases without knowledge of the operational tools. This situation must be reviewed and modified as appropriate in order to avoid obsolete data bases and unnecessary costs as the discipline specific design tools are released through MTEC training programs.

• The "discipline specific" tools must be constructed upon the same statistical philosophies and theories if they are work together in a synergistic fashion. In other words, the equations, techniques, and procedures must use a common base of logic, symbols, and terminology. This will greatly simplify course development, on-the-job application, software development, tool inter-changeability, and inter-disciplinary communication.

• In order to accomplish the objective by Q2-90, it will be necessary to employ two full-time applied statisticians with strong technical writing skills. Their efforts will focus on the research, development, and documentation of the primary design tools. They will also conduct follow-on activities well into the future; e.g., software development/support and consulting to the various functional areas. In addition, they will be cross-functionally and concurrently involved with the other key initiatives. In order to document the various design tools and software, the services of GEG Tech. Pubs. will need to be retained. Approximately 2000 labor hours will be required for the documentation effort. Course development will be undertaken by MTEC at their expense. Some travel by GEG personnel will be required to support the MTEC work.

As you can see by this partial example, many of the key issues have been addressed. With this done, the information was easily be put into the following standard reporting format[1]:

1.0 Objectives: Specific statements of what is to be accomplished.
2.0 Capabilities and Skills: What we currently have and what is needed.
3.0 Major Issues: Short and long term obstacles, problems, etc.
4.0 Strategic Thrust: Direction being pursued as described in 3.0.
5.0 Resources: Estimate of capital and headcount to achieve objectives.
6.0 Assessment of Cost vs Benefits.

Following the formatting exercise for the "Design for Manufacturing" initiative, the group addressed the remaining key initiatives in the same manner. Next, the information was summarized and formulated into a roadmap. The total package was formatted with a cover page and table of contents and submitted to management for review and consideration.

Currently, the *GEG Statistics Advisory Board is scheduled for such an activity on May 30, 1989 at 12:30 PM. The meeting will be held in Room No.* 2300C *at* (see above) . Remember, the final document must be presented to management NLT June 9, 1989 so that they have time for review and writing.

Many times, we, as practicing statisticians, have been quite vocal about what "should be done." Well, now is the time for "walking our talk," so to speak. Simply stated, management is counting on our knowledge and technical leadership to revitalize the Six Sigma program and pave the way well into GEG's future.

If you have any questions, please feel free to contact either myself or John Hathaway (SAB Vice-chair).

Thank you for your support and contributions.

Mike Harry

---

[1] The originating document dated May 15, 1989 (From Dick Orr) is attached for your convenience so as to put our task in the frame of the "big picture."