

Computer Documentation is the Easy Stuff

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Robert Gidley, the *SoundViews* editor, issued a call for contributions recently, and in doing so he cited Laura Gregg's complaint that the Puget Sound Chapter seems largely focused on computer documentation.

Here is a response to Robert's call, and it focuses not on computer documentation but on procedure writing for the nuclear power industry. Relatively few people, we think, know that Battelle's Human Affairs Research Center, based in Seattle, is a national center for the design of nuclear power plant procedures. Battelle has devised the federally mandated guidelines for these procedures, often provides training for the technicians and writers who prepare them, and ensures that the completed procedures conform to the guidelines.

The Battelle power plant procedures group is headed by Val Barnes. Some of the people involved are Barbara Kono and Chris Moore — who along with Doug Wieringa are graduates of the Technical Communication Department at UW. Elise Morse, another TC grad and former STC officer, is working for this group as a contractor. Dave Farkas is currently involved as consultant. Doug has been at Battelle for 4 years, and has managed a variety of projects related to nuclear power plant procedures.

A look at the world of nuclear power plant procedures can lead to an intriguing conclusion. Relatively speaking, computer documentation is the easy stuff. We don't quite mean that. But nuclear power plant procedures, and by extension other kinds of critical-service plant documentation, pose some very special challenges. We hope that *SoundView* readers and especially the many folks writing computer documentation will enjoy a quick peek at a very different domain and will gain some useful perspective on their own activities.

Interface

One major difference between computer and nuclear plant documentation is that writers of computer documentation enjoy a special luxury: they describe interactions that are constrained and simplified by a human-computer interface. It is usually easier to describe menu choices, mouse actions, system messages, and elevator bars, than to describe the much fuller range of phenomena that can occur in the natural world.

A writer for the nuclear industry, for example, may have to deal in the subtleties of corrosion or tell the audience just what degree of "spurtiness" from an oil leak requires a particular action. Much of the time, of course, nuclear power plant operators interact with their plant by another interface, one made of up of

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Next Meeting

Tuesday, November 27
Working With Other Professionals

Tyee Yacht Club

Panel discussion of working with other professionals. Details on page 10.

Meeting starts at 6:30 pm, cost is \$12.00. Call the STC office (623-8632) to make reservations.

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indicator lights, knobs, valves, and levers. But this interface, we suggest, is more diverse and less structured than a keyboard or mouse interface.

Complexity

Another important difference is that few software programs (especially in the microcomputer world) are nearly as complex as a nuclear power plant. Not only are there many more procedures entailed in the operation and maintenance of a nuclear power plant, but — in contrast to most software procedures — they are deeply intertwined. That is, any single procedure can be affected by changes — often unexpected — that are taking place continuously within the system as a whole.

Critical-Service Considerations

This brings us to the issue of safety, and the implications of this issue for documentation. As a complex physical system, a nuclear power plant is more prone to failure than an electronic system such as a computer — though a plant is designed to provide multiple backups for all systems. Furthermore, the potential consequences of failure are far more severe. Finally, nuclear power plant operators may well have to respond to unexpected events within severe time limits. Few software writers — and the exceptions mostly document mainframe software — need address the possibility of hardware failure or write procedures which absolutely must be understood and executed in a matter of minutes.

Battelle Solutions

In some respects, then, computer documentation — especially microcomputer software documentation — is “the easy stuff,” at least in comparison to nuclear power plant procedures. How has Battelle dealt with the special challenges they face? First, Battelle initially approached their assignment as a research question and assembled a multidisciplinary team to study all aspects of nuclear power plant procedures and safety. In particular the team members learned as much as they could about the plant operators and the cognitive burdens the operators face carrying out procedures in both normal and emergency conditions. The team members also studied all the literature pertaining to procedures, and where the literature did not provide answers to important questions, they conducted their own empirical studies. Finally, the designs they devised for improved procedures were tested repeatedly both in the lab and in the field before they were organized into guidelines for the nuclear power industry to follow.

Among the solutions devised at Battelle is a special two-column format in which procedure steps are presented in overview form in the left column and in greater detail

in the right. Operators save time by reading primarily in the left column and only look in the right column when they really need to. Battelle also makes extensive use of procedures presented in flow chart form, and they have developed a set of flow chart conventions especially suited to the nuclear power industry.

Conclusion

As we debate whether software writers have it easy or not, we must acknowledge that nuclear power plant writers have at least one factor working strongly in their favor — their audience. Plant operators are never novice users. They are technical experts, they receive regular training and drill, they frequently carry out procedures working in teams, and they are highly motivated. Quite a contrast, to be sure, to the impatient hacker or the computer-hating bumbler that many software writers see before their eyes as they begin writing a new manual. Finally, one thing that few will debate is the value of the Battelle approach. Gounded as it is in empirical research and extensive interaction with the eventual users, it is a formula for success in all of our documentation efforts. **STC**

