

Douglas J. Albright - President
Actuation Test Equipment Company
3393 Eddie Road
Winnebago, Illinois 61088
815-335-1143
DudleyDevices@Aol.com

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Linda Greyerbiehl
Judicial Assistant to Judge James A. Redden
1527 U.S. Courthouse
1000 Southwest 3rd Avenue
Portland, Oregon 97204

Subject: Background information – a copy of [ANSI/IEEE Std-1207](#).

Dear Linda,

I'd like to pass along a few documents for background information. Enclosed is a copy of the relevant pages of the ANSI/IEEE Std-1207. The goal in the preparation of this manual is a clarification, with better explanations and tutorials, of the information contained in [IEEE Std-125](#) - this time intended for non-technical folks.

The number assigned to each standard is incremented as they add new standards to the body of information, so the difference in number would indicate that some time had passed before they decided Std-125 wasn't achieving its intended purpose.

The original purpose of the ANSI/IEEE Standard 125 (Std-125) was to provide industry standards, or limits, for the performance of hydroelectric turbine governor equipment. They are a representation of what capable, competent manufacturers are able to achieve. If one organization can achieve this level of performance, then all should be able to achieve the same level of performance in order to sell equipment into this market.

To head trouble off before it happens, and to deal with it when it does - these standards are intended for use in preparing (and mediating disputes over) contractual guarantees. These standards are not mandatory – but by writing them into the acquisition documents the contract's authority makes them mandatory.

The rub here was that Std-125 is too complicated for the intended audience; it contains mathematics and engineering concepts unsuitable for lawyers, liberal arts majors and other non-engineering types that typically populate contracting offices. This manual didn't turn out to be particularly useful.

To achieve the desired goal, ensuring proper equipment by getting the contracts right, IEEE set about preparing another manual with the same information as is contained in the Std-125 manual, but in a tutorial form to be more universally understandable, and useful to, applications engineers and contracting officers.

The result is a specifying tool for turbine control systems that's easy to use. Applying its precepts to the contracting process will ensure robust and accurate wicket gate and blade positioning, essential to maximizing turbine-operating efficiency, and a system for mediating disputes when contract guarantees are not met.

I've highlighted three paragraphs that are germane to this situation. Paragraphs 4.7 and 4.8 on page 11 contain descriptions of the turbine control system performance characteristics of "deadband" and "deadtime." These are quantified at 1.0% deadband, and .2 second deadtime by this manual.

Paragraph 4.9 is somewhat more subjective; measurements of damping ratio and settling time are much more complicated. They include the performance of other elements in the system, including the turbine and the water passageways that bring water into the turbine, and conduct it away downstream. The absence of a quantified value for use as a limit makes these less useful for contracting officers, but it puts these concepts on the table for the engineers to work with.

I've also highlighted a couple of names on the back of page iv (the back side of the second page) from the introduction to the standard. Dave Kornegay is the Chairman of the IEEE Std-1207 committee. He has given me permission to distribute the attached excerpt from their Std-1207 manual on a limited basis to folks that might be able to use the information. Sending a copy to you is within the scope of my permission, and it will certainly help the Court understand this aspect of the fish mortality problem.

Also, please note that Edward P. Miska, Jr. is a voting member of the committee that approved this guide, and is quite likely to be familiar with its topics. Mr. Miska is also an Electronic Engineer (an "EE" part of IEEE) who is working on the turbine control systems used in all of the Corps' Columbia River Basin powerplants. As such, he is certainly quite knowledgeable of the condition of the Corp's equipment, and would be able to tell the Court whether or not the Corps' Kaplan turbine blade control positioning meets this standard's limits, and would be able to explain why not if they don't.

Sincerely yours,

Doug Albright