Standards Development: Enclosed Drives

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Who doesn't like to see their name in print, or words that they've written be included in part of an international document? It's an amazing feeling to be part of a group that helps shape worldwide activities.

What am I talking about? Well, it's membership and activities in a committee in the AGMA Technical Division of course. I originally became interested in finding out what exactly happens in one of these committees, and now I am chairman on one committee and contributing to two others!

I currently hold the chairman position of the Enclosed Drives committee. We have responsibility for AGMA standards 6001-E08 "Design & Selection of Components for Enclosed Drives" and its metric counterpart 6101-E08; 6013-A06 "Standard for Industrial Enclosed Gear Drives" and its metric counterpart 6113-A06; as well as information sheet 14179-1 "Gear Reducers – Thermal Capacity Based on ISO/TR 14179-1." Our committee also provides a technical advisory group (TAG) response to ISO working group 10 activities. This basically provides the U.S. position on any proposed standards or documents that ISO is revising or creating.

AGMA 6001/6101 deals with design of the major non-geared, load-bearing components in a geared drive: shafting, keys, fasteners, bearings and housings. AGMA 6001/6101 went through a major edit for its "D" revision released in 1997. Since then, the committee was tasked to review the content and make improvements and modernization where possible. A lot of work was put into making the shaft deflection example more "programming friendly" and to continue the great work done for the D97 release. Another significant amount of time was spent on refining the key and fastener sections to align more with other international standards.

AGMA 6013/6113 is a "new" standard in that it combines and supersedes two other standards: AGMA 6009-A00 "Standard for Gearmotors, Shaft Mounted and Screw Conveyor Drives" and AGMA 6010-F97 "Standard for Spur, Helical, and Herringbone and Bevel Enclosed Drives." AGMA 6013/6113 covers topics dealing with both gear rating specifics from AGMA 2001-D04 and general enclosed gear drive component design and configurations such as service factors, preferred ratios, shaft diameters, standard shaft configurations, lubricant selection and others. This was an admirable effort by all involved to not only combine standards and resolve any inconsistencies, but to incorporate an entirely new lubrication section based on AGMA 9005-D94. During the creation of the new standard, the thermal rating section of AGMA 6010-F97 was removed and incorporated into the AGMA information sheet 14179-1. As with most standard revision, efforts were made to incorporate the latest information from other AGMA standards. This required an update to the rating formulas based on AGMA 2001-D04 and also added some updates to the stress cycle factor.

AGMA/ISO 14179-1 was an extract from AGMA 6010-F97 with an update based on the referenced ISO standard. We felt that the subject matter was deserving of its own information sheet and shouldn't be tucked

away inside of another standard. At the time of creating the information sheet, we were able to incorporate the great work done by ISO and fellow AGMA member companies within the document. Information sheets are different from standards in that they may be focused on one aspect of an enclosed gear drive, or are on a narrow scope of application and therefore are not suitable for an entire standard.

So you can see that the enclosed drives committee is involved in a lot of different aspects of a geared system from gear design and rating to component design, lubrication and all the other bits and pieces that a designer must consider for the total geared package. We rely on the experience and involvement of everyone on the committee to contribute not only their time and company's expertise, but their willingness to help create what you read in the standard. If you've heard of the old adage that "you don't truly know a subject until you teach it," you can definitely apply that thinking to "…until you have to write a clause in a standard." There's no better way to understand a subject than to have to create the illustrative example. I've found it a great way to refresh and reaffirm my design practices, and it is a comfortable feeling knowing that we may help a gearbox purchaser to better communicate with his vendor, or to help guide a gearbox manufacturer in the proper design methodology for his product. Contributing on a standard also allows a company to voice its opinion on the subject, which will benefit not only that company, but the gearing community in general. Member companies can come to a consensus on the best practice for a particular subject, put it in writing, and publish the subject for all to use.

Committee 6b, the enclosed drives committee, is currently working on further enhancing 6001-E08 "Design & Selection of Components for Enclosed Drives" by expanding on recommendations for housing and other static or interface design considerations. Equally as important as rotating elements, the static components must be able to maintain gear position, carry shaft loading, be able to be assembled and allow a user access for various monitoring and service functions. We have also begun discussions on creating a new document that will cover geared units specifically for crane service. We are at the very beginning stages of this discussion and would welcome any input from the crane community on the viability and subject matter.

So what's it like to be on an AGMA Technical Division committee? In a word: great! I've met some really great people involved in the gearing industry, and am continually impressed with the dedication of the AGMA staff. No matter what your level of experience, there is always a home in a Technical Division committee. Find something that you know a lot about, something you know a little about or something you'd like to know more about and get involved! Who knows, you may end up being chairman…