Going High Tech:

In the July *JCR*, we learned about the high-tech courtroom used by the U.S. Nuclear Regulatory Commission to conduct hearings in various locations at the same time. Here, we have a chance to find out more in an interview with Administrative Judge Paul Bollwerk.

The U.S. Nuclear Regulatory Commission is an independent federal agency responsible for the regulation of nuclear power and the civilian use of nuclear materials. The NRC is tasked with ensuring adequate protection of public health and safety, promoting common defense and security, and protecting the environment.

As part of the regulation of nuclear reactors, materials, and waste, the NRC's Atomic Safety and Licensing Board Panel conducts hearings on the applications of commercial and government entities seeking licenses. For many years, the ASLBP has conducted hearings within a traditional courtroom environment, used hard copy documents as evidence, and generated paper transcripts for each day's proceedings.

With the turn of the century, however, the NRC was confronted with the prospect of increasingly complex proceedings that were likely to result in a rapidly increasing volume of litigation-related paper documents. In particular, the NRC was facing what is widely expected to be one of the largest and most complex administrative hearings in U.S. history: the potential licensing of the country's first long-term, high-level nuclear waste repository in Yucca Mountain, Nev.

The proceeding is expected to include up to 300 times the normal number of pleadings and evidentiary material and up to four years of electronic and video transcripts. In addition, the court must make this material simultaneously available to possibly 100 or more different participants, including judges, law clerks, litigants, and witnesses, at geographically dispersed hearings 2,500 miles apart in ASLBP hearing facilities in Las Vegas, Nev., and Rockville, Md. The NRC, to adjudicate this license application and others efficiently and effectively while still meeting its public openness and accountability responsibilities, needed to ensure that the judges and all the parties can create and have access to a digital record consisting of all video, audio, and data information generated in the proceedings.

Acting as the prime contractor and systems integrator for the NRC, Nortel Government Solutions brought together internal experts and industry-leading partners to solve the NRC's business challenges. The NGS team took new technologies and combined them into one integrated, seamless system. Today, the digital courtroom enables users to gain access to the hearing documents anytime and anywhere.

The *JCR* had an opportunity to interview one of the digital courtroom project sponsors, Administrative Judge Paul Bollwerk.

***JCR:* What led to the need for a digital courtroom?**

Bollwerk: The real impetus behind the digital courtroom project was the high-level waste repository proceeding involving the potential license application by the Department of Energy for authorization to construct the Yucca Mountain facility. The potential for a substantially increased volume of filings and evidentiary materials in a proceeding likely involving multiple presiding officers, a dozen or more parties, and a congressional mandate to reach a determination on the DOE application in three to four years all strongly suggested that the traditional paper-based approach to litigation was not likely to be successful.

Our first step was to carefully plot out the digital courtroom project. This was done in conformance with the agency's requirements around establishing IT projects. We worked as a team to figure out and define our functional requirements, which included getting input from several counsel who had previously appeared in ASLBP proceedings and, therefore, were potential system users. In particular, we tried to map out what was and wasn't important, because functional requirements drive project costs.

It is important to note that this courtroom system is one part of what we call the Adjudicatory Meta-System, a group of four agency systems initially designed to handle the high-level waste hearings. A Web-based, publicly accessible discovery database, called the Licensing Support Network, is operational and currently contains approximately 40 million pages of documents. An electronic document intake system, referred to as the Electronic Information Exchange or E-Filing System, utilizes digital signatures for authentication and provides the participants with automatic e-mail notice of and electronic access to litigant filings and presiding officer issuances. The Electronic Hearing Docket is the data repository that stores and makes available all hearing material in a publicly accessible Web-based format. And finally the Digital Data Management System is our litigation or hearing management system that permits us to use this digital information real-time in a hearing room setting.

In the context of the metasystem, one area we looked at very closely for the DDMS was the development of a comprehensive digital database. Today the DDMS can house all of the information that will be submitted in and used during the HLW hearing and other agency adjudications. Additionally, the documents in the DDMS needed to be available to litigants and judges at all

One Judge's View

times. For this reason, the DDMS was built to be Web-based and accessible via password. This is key for users, who can access important litigation information securely whether they are in the office, in a hearing, or at home.

In the planning stage, the critical process of carefully identifying and considering the functional requirements beforehand was made somewhat easier when we went to develop the Las Vegas-based portion of the system, because we had an existing courtroom in Rockville as a prototype. The initial overall scope of the project was increased by the need to backfit this existing site, as well as design a new hearing room in Las Vegas, in order to meet the commission's general policy that proceedings be conducted, to the extent practicable, near the facility or nuclear materials at issue. The Rockville project, nonetheless, gave us great insights we were able to incorporate into the Las Vegas project later on.

***JCR:* What did NRC hope the digital courtroom would accomplish?**

Bollwerk: First of all, we knew that there were going to be a lot of documents involved in the Yucca Mountain hearing. While there likely will never be totally paperless hearings, the hope was to try and make that hearing process as paperless and efficient as possible.

In that regard, one huge benefit of the digital courtroom, as we have designed it, is that we don't have to physically stamp each document submitted into evidence. In past cases, we would have the parties submit an original and two copies of each evidentiary document and then would stamp and mark each of them to put them into evidence. The ability to access and process these evidentiary documents digitally by having the vast majority of them already in the system and queued for processing, then having an electronic process by which the clerk marks each document with a digital stamp and enters the date and time of processing will, we think, be a huge time savings.

***JCR:* How is the system used?**

Bollwerk: We've begun using the system for prehearing proceedings – oral arguments and conferences. At this time, we've not used it for an official evidentiary proceeding, although it has been tested in the background, as it were, by mirroring the paper process being used in other proceedings, thereby allowing us to test the system before we put it into full production.

While designed for high-level waste repository case, the system can be used for any of the licensing or enforcement cases we have. The one limitation on the system is that it resides currently in the ASLBP's Rockville and Las Vegas hearing facilities. For a lot of our cases, we make an effort to go and conduct the proceeding in the vicinity of the site of the reactor or where the nuclear material or waste is located. We, nonetheless, are working to make use of the system's functional capabilities remotely — out in the field — on an as-needed basis. That is being done on an experimental basis, and we are hoping to do more with the upcoming combined operating license cases for new power reactors.

***JCR:* What are some of the key differences between this system and the former hearing procedure?**

Bollwerk: While we've had access to digital documentation in our proceedings for nearly a decade, using a system like this does take some getting used to, particularly in an evidentiary hearing setting. Access to the system requires a digital certificate and a user password, which we don't provide until judges and litigants have had several hours of training on the system and how to use it. Our judges, particularly the ASLBP judges who have technical or scientific backgrounds, have been very interested in using the system. As I noted earlier, the system is Web-based, and users can get at it at home or from their office — they don't have to be in the hearing room to access the database. We think that is invaluable, both in terms of access to the data in the system and as a tool that allows users to familiarize themselves with the system before they have to use it live in a hearing room setting.

Certainly, the data digitization process, when you try to establish it from cradle to grave, presents hurdles for the users to overcome. We looked carefully at the electronic filing process and provided extensive guidance for the way the documents should be formatted as they come in. We set a 50-megabyte limitation on the maximum size of any one file that can be submitted via our e-filing system, and [we] required the documents be in a PDF format. We've also put together a standard numbering system for evidentiary materials in cases that are to be tried using the DDMS, which we've thought through very carefully.

From the earliest stages of the design process, we sought generally to design our system to fit our hearing process. At the same time, we tried to anticipate the features that litigants and presiding officers would want to have, such as a very powerful search engine. We think users will find the ability to search for keywords to be an incredibly useful capability for accessing timely information, whether in party filings, evidentiary materials, or hearing transcripts.

Like any new system, there is a period of adjustment. People right out of law school probably will have an easier time using the DDMS because they have a much greater familiarity with computer systems. People with a greater amount of familiarity with paper-based processes may need some time to adjust.

***JCR:* How is the system maintained?**

Bollwerk: A combination of federal employees and contractors maintain the system on a day-to-day basis. There is also a clerk of the court who will administer or operate the system during a prehearing conference or evidentiary hearing.

The NGS team works on the system regularly, maintaining the database on a

daily basis, as well as giving assistance during hearings. We probably see one or two of a half dozen NGS employees on a rotating basis, depending on what is needed on the system. On average, there are three full-time Nortel employees available at all times to the NRC IT team, if needed.

We do expect that the size of the ASLBP team involved with system operations will increase once the hearings begin. We are trying to train more of our administrative staff to assist with the system as a clerk of the court because, in some cases, hearings may start at 9 a.m. and go until early evening.

***JCR:* What sort of training programs do you have in place?**

Bollwerk: We held a training session for judges, run by one of the ASLBP IT team's project managers. In these sessions, we try to give an overview explaining why the DDMS exists, how it interacts with the overall metasystem that has been put in place to conduct proceedings digitally, and how the DDMS's major functionalities and capabilities work.

The training illustrates the various steps in accessing the system and its functions by using PowerPoint slides and live displays. Once we've shown the users the various capabilities of the system, we then provide hands-on exercises. The judges work through functions, [such as] accessing documents, notetaking, and chatting with other ASLBP users. In these exercises, they can get a feel for the system. We then encourage them to go back to their offices and homes and use it on a regular basis.

In terms of litigants, the process is a little bit different because there are system functionalities they would use that the judges don't, such as scheduling evidence and witnesses. This requires some additional, special training. ASLBP law clerks, as well as the ASLBP clerks of court who really have to know the system front to back, also receive specialized training for their user roles.

***JCR:* What security measures are in place?**

Bollwerk: NRC information technology systems are subject to the requirements of the Federal Information Security Management Act. Therefore, we had to go through a rigorous security certification and accreditation process to get the required authority to operate for the system. This is an intensive process that involves the system being thoroughly checked against a series of IT security standards. The DDMS had to be tested and checked to make sure it met all of the requirements.

This testing involved our IT team, NGS contractors, and a process of independent validation. The security standards for the DDMS are considered "Level 3" within the federal government. Although Level 3 is not the highest level of security for a federal IT system, it, nonetheless, does allow proprietary or other nonpublic sensitive information of a similar type to be placed into the system. The DDMS cannot, however, contain information that has been designated as what we refer to as classified or safeguards information.

We ensure the integrity and security of the information in the DDMS by issuing each user a digital certificate and password to use in accessing the system. For the nonpublic information on the system, the security for each document — that is, who has access to the document — is controlled at the document level. However, given the need for transparency in the hearings, any documentary information generated during the hearing process that can be made public is available on the EHD site.

***JCR:* What are the benefits of the system? How will this help NRC?**

Bollwerk: Overall, the digital courtroom has been designed to allow us to be more efficient in accessing documentary material and processing this information. Clearly, the availability of the information via a Web-based interface with a powerful search engine should definitely be an aid to all of the litigants.

The system also provides access to video files of proceedings conducted in our Rockville or Las Vegas hearing rooms. Users can look at a video of the hearing, which has been married to the realtime-generated court transcript of the proceeding. This should be extremely valuable because you can find through a word search the portion of the transcript that contains the particular terms about which you are interested, and by clicking on the transcript, then simply view the video and the transcript at the same time.

Another great feature of the system is the evidence display capabilities in the hearing room. Litigants and judges can see documents in the system on the computer screens in front of them, while the attendees can see the documents on the large plasma screens in the hearing room. This allows the litigants, the judges, and the public to see what's being discussed.

Touch screens also are available in the courtroom and permit witnesses to annotate documents being used, capture annotations digitally, and place edited documents into evidence. In addition, both ASLBP hearing rooms have the capability to use video conferencing and teleconferencing to bring remote witnesses and other participants into the process and to generate an audiovisual signal that can be Webstreamed.

The system also includes assistive technology for people with hearing and visual impairments. The system is designed to be compliant with the Americans with Disabilities Act, section 508, in several ways. Headphone sets, which work on an infrared transmission basis, allow a litigant or member of the public to hear the proceedings at an enhanced volume. The headphones also can be used to provide listeners with a simultaneous translation of another language being generated by an ASLBP-appointed translator sitting in the hearing room. And the Line 21 signal generated by a realtime court reporter can be displayed, thus providing a closed-captioning crawl for the hearing room monitors, as well as those who might be watching via a computer Webstream.

The digital courtroom is designed to help a judge or litigant who is visually impaired. The system is compatible with screen reader software that provides the visually impaired with the ability — by using a set of plug-in headphones — to hear the text otherwise being displayed on the computer screen in front of them.

***JCR:* What are some of the drawbacks to the system?**

Bollwerk: We never want digitalization to become a barrier, so we have tried to pay close attention to ensuring the system could remain flexible and inclusive.

That said, digitization of evidence does require a bit more preparation up front. To realize the efficiencies of the system,

litigants have to be well-prepared with their documents, so the documents can be submitted via e-filing and queued up in the DDMS to permit the court clerk to readily access [the material] for marking and disposition. We are hoping that the pre-hearing time spent planning and preparing will result in efficiencies being realized on the other end of the process.

We also are conscious of the fact that participants likely will need Adobe Professional software to ensure that their documents can be included in the database in an appropriate PDF-format. Adobe Professional can cost several hundred dollars, which can be a significant expense for some, particularly pro se petitioners or small public interest groups. While law firms will readily have access to this software and capability, an individual practitioner or environmental organization will have to incur this cost, albeit very much like it must now incur the costs associated with generating and reproducing paper copies of documents. Although we felt strongly that these incremental costs are a small price to pay to achieve the significant benefits of the more efficient, paperless process, we are also looking at ways we can make a PDF-rendering process available to litigants without charge as a component of the e-filing process.

***JCR:* How will you measure the success of the digital courtroom?**

Bollwerk: I think the simplest way will be to gauge whether the litigants find the new capabilities afforded by the system useful to them. Right now, in terms of design and development, as well as getting the system in place and getting it to operate the way we want it to, I think we already have achieved a substantial measure of success.

***JCR:* What were some of the lessons learned?**

Bollwerk: As we went through the project, there were certainly considerations added that weren't initially contemplated. With a project as ambitious as this one, you need to plan as early as you can, as best you can, but with the knowledge that there likely will be changes as you go along. The best approach is to think as expansively as you can when coming up with the system's functional requirements, recognizing that everything you can conceive of cannot necessarily be implemented. In that regard, we were fortunate to have the Rockville facility as our first project. A lot of the lessons learned [in Rockville] were very helpful with the Las Vegas facility, which is where we are likely to conduct the bulk of the HLW-related proceedings.

ABBREVIATIONS

ASLBP	Atomic Safety and Licensing Board Panel
DDMS	Digital Data Management System
DOE	Department of Energy
EHD	Electronic Hearing Docket
HLW	high level waste
NGS	Nortel Government Systems
NRC	Nuclear Regulatory Commission

***JCR:* How does court reporter fit into the new digital courtroom?**

Bollwerk: The court reporter's perspective was an absolutely essential part of the design process as we looked into building the digital courtroom. Because we were considering extensive use of realtime court reporting, we sought design input from a realtime court reporting firm that we tried to take into account to provide efficiencies for the court reporter as well. Particularly for the Las Vegas facility, which was built from scratch, we looked closely at what would be an ideal court reporting station and what we could do to make the court reporter's job easier. And in that facility, we do have the capability to locate the court reporter's station on either the right or left side of the front of the hearing room well, depending on what might be considered the best location for the type of proceeding being conducted.

Additionally, because of its video capture and display capabilities, the digital courtroom offers a court reporter the potential to see more of what transpires at a proceeding. The system's video-follows-audio functionality generally will permit [the court reporter] to see a close-up shot of who is actually speaking via the DDMS display at their work station computer monitor. Additionally, within a relatively short time period after the proceeding ends, we can make available either DDMS online access or a DVD copy of the video of the proceeding as an aid to the court reporter in correcting the transcript. The availability of video as a backup should be a significant help in meeting the ultimate goal, which is the most accurate record of what happened in the courtroom.

***JCR:* How will the system evolve over the next decade?**

Bollwerk: Over the next several years, the trick will be to stay poised on the technological cutting edge without getting sliced and diced. So far, we have done that with at least a modicum of success in terms of our goal of making it easier for the judges and litigants to come into the hearing room with a minimum amount of paper and still have ready access to everything important they need through the system. One would expect that the future availability of faster computers with more memory and storage capacity will further enhance our ability to meet this goal.

One thing we know that some of our judges want is an enhanced notetaking capability in the hearing room that will allow them to make comments right on electronic documents they might be viewing. Right now, the judicial notetaking capability in the hearing room permits the saving of time-stamped notes entered via a keyboard. What we may be looking at more closely is the ability to permit the PDF documents in the system to have comments inserted into them and saved to the "briefcase" file that the system allows each judge to establish as a method of retaining and organizing system documents that are of importance to them.

Also, as it is used more frequently, the digital courtroom should make our proceedings more inclusive and transparent to members of the public by reason of their being able to observe and understand more fully what transpires in our hearings. And this benefit will be realized even for those individuals who cannot actually come to our hearing rooms — thanks to the system's Webstreaming capabilities.

Finally, my hope is that there are ways, through the use of this system, that realtime court reporting can be made more efficient and effective. If the ultimate goal for a court reporting process is to provide a transcript that is as accurate and timely as possible, this system provides ways to do that. ■