Effective Use of Courtroom Technology: A Judge's Guide to Pretrial and Trial

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Common problems

As lawyers become more knowledgeable about the effects of technology on the ability to present facts and arguments to judges and jurors, they raise more issues that may need to be resolved by the court. Almost all problems related to technology can be worked out informally following relatively well-accepted practices. The court's willingness to manage the process usually leads even the more contentious and less well-informed lawyers to find common ground. This section outlines the questions likely to arise. Parts II, III, and IV provide more detail about uses of technology during discovery, pretrial, and trial. Appendix C collects existing local rules with respect to courtroom technology, and Appendix D sets out sample pretrial order provisions for civil and criminal cases.

Discovery issues

During discovery, the principal issues revolve around one party's demands or the court's requirements for exchange of discovery materials in digital format. Counsel who is looking ahead to the pretrial and trial phases of the case will appreciate that obtaining documents, photographs, and video in digital format is a substantial advantage. This will minimize costs, increase efficiency, and allow more time for focus on the theory of the case and its presentation.

When demands are made for materials in digital format, subsidiary questions can arise out of the differing approaches of the parties to the use of technology.

- **Format.** Documents and photos can be put into a number of different digital formats—each of which have special characteristics that may make it easier or considerably more difficult for the opposing party to use. Videos have no format problem because one format is both the industry standard and the heavily dominant format in the field.
- **Compression**. Digital files are typically compressed so that they take up less storage space. Because there are a number of methods for compression, in some cases closely associated with the format used, objections may be raised to the choice made by one lawyer or another. Some compression methods discard data; others retain all data. Sometimes this has importance for litigation, but ordinarily it does not. As with format, these problems relate to documents and photos, but not to video, as all digital video uses the same compression method.
- **Resolution.** Digital versions of documents and photos can be produced at different resolutions. This may make it easier or harder to process documents so that they can be searched, and to display clear versions of documents and photos in the courtroom.

A second set of potential problems arises out of the ease with which digital documents, photos, and videos can be altered in ways that are very difficult to detect without an expert's examination. Some

alterations occur during normal processing and are usually unimportant for litigation purposes. Other alterations occur because a party wants to demonstrate a particular point. This is generally significant only if the alteration remains undisclosed.

A third set of questions involves the discovery of materials that are used in digital format—databases, CAD/CAM files, fax server files, PDA files, and digital voice mail files. Beyond the willingness and ability of the responding party to produce these materials lie issues about copying the data, access to the software necessary to search the data, and access to the data *in situ*.

Internet discovery repositories offer relatively low cost storage for large volumes of materials that will be accessed by numerous lawyers. When objections with respect to time limits and cost arise, the court may want to consider this alternative.

Part II contains additional details on these discovery matters.

Pretrial issues

In order to gain the benefits from the use of technology while maintaining fairness and a relatively level playing field, counsel may raise or the court may require counsel to consider questions with respect to disclosure, shared use of equipment, and making an adequate record with respect to electronic displays. Technology may also be involved in hearings by videoconference to save time and expense, using visual displays in presentations to the court during hearings, and educating the court on complicated scientific or technical matters.

Adequate disclosure is usually necessary to ensure that potential problems are disposed of well before trial.

- **Equipment.** The court needs to know about any equipment that lawyers plan to bring into the courtroom; and both sides should know about the plans the other has to make use of equipment already in the courtroom.
- **Software.** Most courtroom displays are powered by presenta-

tion software. There are a number of different software packages, most of which have some incompatibilities. To guard against problems with exchanges of digital exhibits at trial, each side needs to know what software the other is using. There is no lawyer work product involved in this information.

- **Exhibits.** Exchanges of exhibits in the format they will be used in the courtroom is essential to avoid squabbles about admissibility or use at trial. This is particularly true of photos and videos that can be digitally altered and animations that take a considerable amount of time to analyze in order to create a defense.

Shared use of equipment minimizes clutter in the courtroom and is usually easily accomplished if planning is done in advance. Cost sharing may also be important if one side brings equipment to the courtroom that the other side wishes to use.

When lawyers adopt display technology, the number of exhibits, particularly illustrative aids, often increases dramatically. Because many kinds of illustrative aids are drawn from evidentiary exhibits, but will not go to the jury room, the court will want to ensure an adequate method for making the record with respect to all the visual displays.

Part III has more information on these and other pretrial matters.

Trial issues

When the trial begins, the court will want to consider some additional steps to accommodate the use of technology.

- **Preliminary matters.** Representations from counsel as to testing, compatibility, and positioning of the equipment protect against appeal. Representations about the availability of backup in case of equipment failure avoids problems when the court insists on continuing with the trial even though some of the equipment is out of commission.
- **Jury selection.** The court may want to give attention to visual

acuity on the part of jurors (some may not be able to see the displays) and color blindness (even if they can see the displays, they may not be able to make out significant differences).

- **Jury instructions.** Putting preliminary jury instructions onto the display screens makes it easier for the jurors to understand and remember the instructions. The court's instructions can be presented from a word processing file or can be put on a set of simple presentation slides for use with a laptop. Another alternative is to have the instructions copied onto sheets for use with the evidence camera.

The distinction between evidentiary exhibits and illustrative aids becomes more important because the use of courtroom display equipment usually causes illustrative aids to proliferate. In some trials, more than half of the things shown to the jury will be illustrative aids. Considerable importance attaches to the principles applied to deciding what is an evidentiary exhibit and goes to the jury room when the jury retires and what is an illustrative aid that is not "evidence" and does not go to the jury room.

Objections may be made to evidentiary exhibits shown with digital displays.

- **Completeness.** Parts of documents may be deleted, photos may be cropped, and digital video may have parts excised.
- **Unfairness.** Documents and photos may be resized and reshaped, and still frames may be extracted inappropriately from videos.

Objections to illustrative aids shown with digital displays are likely to be somewhat different from those made when illustrative aids are used in hard copy.

- **Unfairness.** Labels, text treatments, colors, motion, sound, positioning, intervals, and repetition may give rise to sustainable objections based on unfairness.
- **Leading.** Displays may have content or markings that will lead the witness in reciting testimony.
- **Argumentative.** Illustrative aids that support an opening state-

ment or lay witness testimony may be argumentative either in wording or in the design of the graphic.

- **Narrative testimony.** Presentation software can embed in a single slide or group of slides an "autoplay" function that, once the slide is activated, continues to reveal new material as the witness goes along.
- **Assuming facts not in evidence.** Under the changes made to Rule 703, effective in December 2000, the court should rule on the admissibility of facts or data relied on by an expert before the facts are displayed in an illustrative aid.
- **Foundation (unsupported opinion).** The displays used by experts may stray from the basis the expert has to offer testimony.
- **Lay opinion.** The titles, labels, or text on slides used with lay witnesses may be objectionable under Rule 701.

Digitally altered photos and complicated computer animations, when offered as illustrative aids, may raise other objections.

Part IV provides detailed supplemental information on these items and information on final jury instructions, jury review of computer-generated materials, computer-generated illustrations in briefs, and digital format briefs.

Summary of experience to date

A great deal has been learned about courtroom technology, particularly in the past 10 years as it gradually emerged in more and more places. Some of the early concerns about the use of display equipment in the courtroom have diminished as more judges and lawyers have gained first-hand experience. This section summarizes the experience to date with respect to the most frequently asked questions about the impact of new equipment in courtrooms. Appendix E lists resources for more information, and the bibliography lists publications relevant to this experience and court Web sites containing information about courts' equipment and practices.

Court-provided equipment vs. lawyer-provided equipment

Courtroom technology installations can be either court-provided or lawyer-provided. Some installations are court-provided in part, supplemented by equipment that is lawyer-provided. Any judge, regardless of whether he or she is sitting in a technology-equipped courtroom, may be faced with any of the questions, concerns, issues, problems, and uncertainties described in this book. There are no significant differences in technical capability for a given trial between court-provided equipment and equipment that one side or the other rents (or owns) and brings to the courtroom. Everything that a court might provide can also be rented and set up efficiently in a courtroom that has no technical capability beyond electrical outlets (although permanent, custom audio-visual systems may be better suited to specific courtrooms and more desirable from a systemic point of view). A court that does not have its own equipment may decide to encourage lawyers to bring in equipment from the outside in order to cut a projected four-month trial to a two-month trial. Judges faced with a trial that promises hundreds of documentary exhibits may urge lawyers to cooperate and share in the rental of the necessary equipment from a local audio-visual equipment vendor. Even in smaller cities, these vendors normally will have all the necessary equipment or can get it from elsewhere on short notice.

Mandatory use vs. optional use

Some courts with technology installations require lawyers to use the equipment. Estimates vary, and no scientific research has been completed, but nearly all judges who use technology agree that it cuts trial time by a significant amount. Most also agree that it helps juror comprehension of complicated issues. With these benefits available, some judges believe that lawyers should not be allowed an election to use older methods in document-heavy cases. One judge uses a 10-document cutoff—if the case involves more than 10 documentary

exhibits, lawyers are required to use the display equipment for these exhibits. The judges who impose these rules report that after the initial "mandatory" use, lawyers become believers because the technology is so much more efficient than older methods.

Other courts with equally capable technology installations allow lawyers to select either newer or older methods, or a mix. These courts reason that some lawyers, particularly those who have been in practice for many years, may be disadvantaged by a requirement to use technology. Their personal styles may not fit with the electronic displays, and they may be more comfortable relying on oral persuasion. Some cases do not require many visual displays or documentary exhibits, and the lawyers are in the best position to know which cases would benefit from technology and which would not.

Court control vs. lawyer control of equipment

In some technology-equipped courtrooms, a court official—the deputy or bailiff—controls the equipment that presents displays. The lawyer indicates which exhibit should be displayed, and the court official operates the controls to make the display appear. In other courtrooms, the lawyer controls all of the equipment except the kill switch used by the court when an objection is raised. The lawyer may use an equipment operator to keep track of exhibits and bring the right one to the screen at the proper moment, or the lawyer may operate the controls directly. Some judges have a middle approach in which the court and its personnel control some equipment, such as video cameras and the sound system, while lawyers control other equipment, such as the evidence camera, the displays driven by computers, and the video printer.

Some judges who require lawyers to use the court-owned equipment in order to gain the benefits of shorter trial time and better juror understanding believe that court control of the equipment is a fairer way to overcome the inevitable disparities in the ability of counsel to cope with these new circumstances. Having court personnel

operate the equipment eliminates certain advantages that knowledgeable counsel may have, and the jury may have a more neutral view about the use of equipment if someone under the control of the court operates it. One judge who uses this method requires lawyers to provide the courtroom deputy with a CD containing the exhibit files and a bar coded sheet listing each of the exhibits. During trial, the lawyer tells the courtroom deputy what exhibit should be displayed, and the deputy uses the court's presentation software to bring it up, highlight the relevant sections, or to zoom in when necessary. Usually lawyers consult with the deputy ahead of time to give a sense of what is important and what they expect to be done in presenting the exhibits. The deputy estimated about 16 hours of training is required for courtroom deputies to learn the basics of the presentation software to be able to support this capability.

On the other hand, lawyer control of the equipment allows more personalized timing in the presentation of exhibits. Such timing is important as displays become more sophisticated, particularly in opening statements and the direct and cross-examination of expert witnesses. The controls are relatively easy to learn and, if the courtroom is made available for after-hours practice, most lawyers should have no trouble learning how to operate the equipment effectively.

Criminal vs. civil proceedings

Most of what appears in this guide applies to criminal and civil cases in the same ways. As courtroom technology becomes more widespread, criminal cases are increasingly likely to be managed in the same way as civil cases. Discovery issues are different, but the pretrial and trial considerations are largely the same. Two areas (other than discovery) require different considerations in criminal cases.

First, videoconferencing raises concerns among criminal defense lawyers. When clients are appearing via videoconference from a prison on arraignment or sentencing matters, defense lawyers believe they need to be with the client but also need to be in the courtroom if the

prosecutor is appearing in person. This raises the prospect of a manpower drain on defenders because two lawyers are needed instead of one. Defenders are also concerned about the possible "dehumanizing" effect of having defendants appear by videoconference from a prison facility. Having witnesses (other than those called by the defense) appear via videoconference at trial, they believe, raises constitutional concerns. The Judicial Conference is currently considering amendments to the Federal Rules of Criminal Procedure related to the use of videoconferencing.

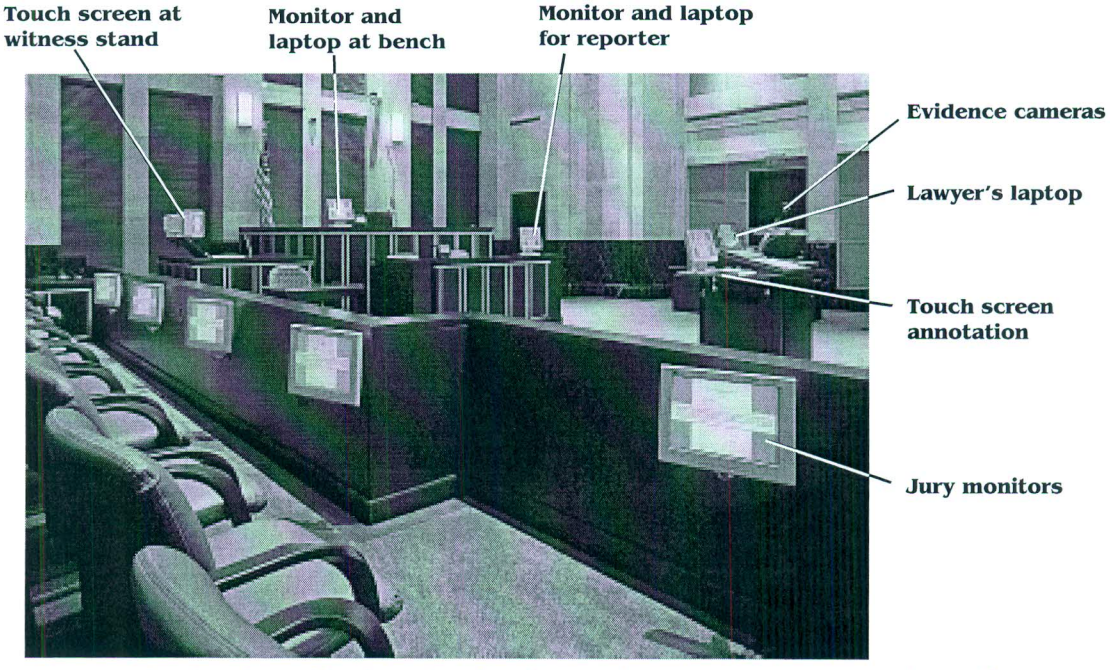
Second, when prosecutors have hardware and software to present the government's case, Criminal Justice Act panel lawyers may need equivalent hardware and software, and may request the court to order the government to provide it. In cases in which these requests include hardware and software costing more than $300 or computer systems and automation litigation support personnel and experts estimated to have a combined cost of more than $10,000, the CJA Guidelines require panel attorneys to consult with the Administrative Office's Defender Services Division prior to applying to the court. The division makes recommendations to the court (to be included in the panel lawyer's motion) to ensure that the equipment and services purchased by the government are suitable and cost effective. A model order is included in the Guidelines.

Appearance of the courtroom

Courtrooms should project a certain gravitas. The space should maintain the atmosphere of a serious and contemplative undertaking. The use of technology can accommodate these requirements. Technology fits reasonably well into most courtrooms. If properly installed, the equipment and wiring can advance, rather than detract from, the traditional look and spirit of the courtroom by making the space more functional.

Each configuration of bench, witness stand, jury box, and counsel tables presents some design challenges for incorporating monitors or

projection screens, but the dignified and functional atmosphere of the courtroom need not change at all. Very small courtrooms usually do not have space for large monitors or a projection screen outside the jury box, and they will be better served by small monitors inside



the jury box. On the other hand, very large courtrooms may be well served by a projection screen placed near the witness stand so that jurors' attention is more focused. Most of the technology components have sufficient flexibility to accommodate design requirements across quite a wide spectrum while maintaining the essential decorum of the courtroom.

Cost considerations

As technology began to appear in more and more courtrooms, many lawyers and judges were concerned about the David vs. Goliath situation in which the financial resources of one side might weigh too heavily on the outcome of the trial. However, the cost barriers to successful use of courtroom technology have become readily surmountable. Even if the court has no equipment of its own, the basic Level One technology components are available for a relatively low cost, either through rental for one-time use or purchase if the advocate reasonably expects to participate in more than one trial per year in which equipment will be used. The training and experience barriers to using the basic technology components are also relatively low. Computer technology is an important part of most law practices for writing, research, filing, and communication. Extending the lawyer's grasp of technology to the equipment required for courtroom presentations is not a long stretch. For example, for a lawyer who has used an overhead projector, the orientation to the use of an evidence camera is quite short. Even for a person who has never used equipment of any kind in a courtroom, the evidence camera's controls are not hard to master. For a lawyer who uses a computer in the office, the orientation to the use of a laptop computer to control the display of exhibits in court is also quite short. Once displays using presentation software have been loaded on a laptop computer, finding and displaying a particular exhibit requires pressing only one or two keys or other controls.

Courts may assist in the training process by making the courtroom available for practice sessions either with the court's installed equipment or equipment that the lawyer plans to bring to the courtroom. For first-time users, regardless of how much trial experience they have, practice is the key to success. Using the equipment in a law office setting is invariably quite different from the demands of the courtroom setting. This is particularly true if the court-installed equipment has different controls. Courts should work with the bar so that lawyers are comfortable with the technology. Knowledgeable court

personnel can help with a general orientation for the bar to the equipment and instructions on its use. The court can put instructional information on its Web site. Some courts have produced training videos to help lawyers understand what is involved in using the technology effectively and at pretrial conferences give copies of the video to lawyers who have trials scheduled in the courtroom. General court-sponsored training in courtroom presentation systems is useful.

Attorneys who invest more time and effort to acquire courtroom technology skills will have more capabilities; this is no different from any other trial skill. The National Institute for Trial Advocacy provides training courses in particular federal courts for those who will practice there, and also provides public training programs covering the use of common courtroom technology. In both types of courses, lawyers can work with equipment in presenting arguments and examining witnesses. A list of these courses is available on NITA's Web site, www.nita.com. Books are also available for help in acquiring the skills to use courtroom technology effectively.

A level playing field

In one sense, there has never been a guaranteed level playing field in a courtroom. An experienced, able lawyer is likely to do a better job for the client than a recently minted law school graduate who has never tried a case. A lawyer with an excellent command of the language probably can explain things to a jury more effectively than someone with poor language skills. Technology has not changed this situation; it has only made the variations occur across a wider spectrum.

In another sense, technology leads almost inevitably to a democratization of the profession. As costs come down, there are fewer "have nots." The retail availability of most components for creating and displaying courtroom visuals means good access across the profession to the necessary tools. The Internet offers online graphics and technical services for most kinds of displays that lawyers use.

Access to technology is only partly a function of financial resources. It is also directly related to the initiative of the lawyer in gaining the education and training needed to use technology effectively. Access is also related to diligent research to find inexpensive alternatives that serve as functional equivalents to what the opposing lawyer may be using. Initiative and research have always been thought to be the responsibility of individual lawyers in offering quality representation to clients. These factors permeate the practice and affect facility with technology just like they affect facility with writing, speaking, arguing, and examination.

Most aspects of the level playing field can be handled readily by judicial management. An effective pretrial conference can introduce all parties to the idea of the use of technology, overcoming the problem that lawyers may have had little or no experience with the use of these valuable resources. Judicial management at this point might result in the parties using technology for document production, depositions, pretrial hearings, and trial displays. The court also has the opportunity to keep the playing field level by advising the parties with respect to the availability and use of equipment and how it would be shared during trial preparation and at the trial. Well-understood ground rules motivate lawyers to use courtroom technology.

Juror perceptions

Jurors who come into a technology-equipped courtroom are usually comfortable with the surroundings and do not find the environment unusual at all. Some jurors have large-screen enhanced television receivers at home and have no difficulty accepting high-quality equipment for the purpose of displaying important evidence. Although the equipment in the courtroom is different from the home and office electronics with which most jurors are most familiar, the analogies are apparent and easy to understand. The equipment for visual displays makes it appear to jurors that what is about to go on in the courtroom will be informative and easy to understand. Moreover,

extensive use of courtroom technology is often the norm in highly publicized trials, so the jurors may have seen exhibits being displayed on monitors and projection screens, computerized playback of video depositions, evidence cameras, and real-time reporting in action.

An interesting parallel to the use of courtroom technology occurred at the *New York Times* in the late 1980s as its editors began to wonder how to compete over the din of television. A study revealed that readers did not actually read the *Times* the way everyone at the paper assumed they did. As recounted with amazement by Max Frankel, then serving as executive editor, rather than plowing through the erudite and lengthy stories that began on page 1, *Times* readers "thumbing through the paper stopped primarily for eye-catching elements like photos, maps, graphics, and headlines. Only if seized by one of these distinctive elements might they then glance at a related article." Frankel's autobiography goes on to recount how "computer graphics could often portray events more succinctly and vividly than either words or photos," a realization that led to the use of graphics displays even on page 1, such as when Interstate 880 collapsed during the San Francisco earthquake of 1989 and the World Trade Center was bombed in 1993. The rationale for the use of graphics by the *Times* for its readers mirrors the reasons why jurors gravitate toward graphics when they survey the evidence that is presented to them.

Jurors become more involved in the proceedings when they can see the exhibits clearly and follow the lawyers' presentations more easily. Properly presented displays on monitors allow jurors to read at their own pace without embarrassment rather than passing an exhibit from hand to hand without time to study it. Jurors also appreciate the generally faster pace of trials using technology. They become impatient when lawyers spend time digging through piles of paper looking for exhibits. Some experts believe that jurors who have seen electronic displays work better as a group because they all experienced the trial "together" and are more likely to have a common understanding of the evidence. Oral presentations unaided by visual

displays require jurors to develop a mental picture of key facts, and those mental pictures may vary widely depending on juror experience and education. In addition, some jurors can deal with descriptions like "the location at the northeast corner of Fifth and Main," or "proceeding in a direction from southwest to northeast," but others find these verbal descriptions confusing. When visual displays are used, deliberations in the jury room may be more focused and less likely to result in irrevocable splits among factions.

One negative factor about juror perceptions with respect to the use of technology is that they may expect more than the lawyers on either side can deliver and may view some of the court's equipment as outdated. Television watchers are accustomed to slick graphics displays. Even the weather commentator usually has better, or at least more interesting, graphics than one sees in a courtroom.

Efficiency for the court

Good technology installations make court proceedings more efficient. Judges have more flexibility to impose time limits on lawyers because technology assists in making presentations move along more predictably. Lawyers can complete openings, closings, and direct and cross examinations in less time than it would take using paper documents supplemented by enlargements or illustrations propped on an easel. Electronic display allows exhibits to be previewed quickly on the monitor at the bench when objections are raised. If an exhibit is needed, the judge can ask to have it brought up on the monitors. That happens very quickly because the computer search to find a particular exhibit is many times faster than a manual search among pieces of paper. Technology installations also can make cross examinations go faster because there are no long pauses to find the page and line in deposition transcripts, and video clips eliminate quarrels about whether what appears in print captures what was actually said.

Each piece of equipment makes a contribution to efficiency. The

court's kill switch makes interactions with the jurors more efficient because the juror monitors can be turned off instantly, and the exhibit will not be displayed for the jurors again until the monitors are switched back on. Real-time transcription frees judges from detailed note taking so that full attention can be focused on what is taking place with the witnesses, lawyers, and jurors. In the event of a contested objection, it also allows the court to look at the pending question or just-uttered answer to see exactly what was said. Videoconferencing gives judges the flexibility to conduct pretrial hearings from remote locations or to schedule the testimony of witnesses at remote locations to fit the trial schedule.

Faster pace for the lawyers

A trial in a technology-enabled courtroom moves at a faster pace and usually takes less time than a trial by traditional methods. Explanations in opening statements and closing arguments can be shorter when accompanied by illustrations and graphics displayed without effort by tapping computer keys or putting materials on the evidence camera. The CD that comes with this book includes examples of illustrative aids on slides that dramatically cut the amount of time needed to explain a concept or fact situation. In the courtroom, exhibits are displayed without the sometimes lengthy pauses for approaching the bench, handing copies to opposing counsel, and passing the exhibit hand-to-hand among the jurors. Examination and cross-examination of witnesses move faster because the annotation tools allow lawyers and witnesses to point to and mark images on the computer monitors without leaving the podium or witness stand. With exhibits displayed readily and the capability to mark the point of focus in a question or answer, there is less unproductive back and forth between lawyer and witness.

With real-time reporting, objections are heard without waiting for the reporter to go back through steno notes to find the place where the relevant passage begins and then reading it aloud. The audio

system can direct the conversation between the judge and lawyers to earphones at the reporter's workstation, so the reporter does not have to get up and move the steno equipment to the bench for conferences out of the hearing of the jury.

This faster pace puts a premium on lawyers' preparation because there are fewer lulls in which to catch up. The case theory needs to be clear and well defined. A fuzzy case theory does not fare well when the focus is on efficient displays and explanations. All of the exhibits must be identified and organized before trial so that digital files can be assembled and stored on the laptop computer to be taken to court. Most of the illustrative aids to be used with the opening statement and the direct examination of witnesses need to be prepared before trial so that they are consistent with and support the case theory.

Effects of technology failures

When electronic equipment is installed in a courtroom, every component is subject to some chance of failure. Most components provide thousands of hours of trouble-free service, but the prospect of failures causes concerns. In fact, electronic equipment failures are very similar to every other kind of failure that occurs in a courtroom—failure of a witness to show up, failure of a lawyer to find the right exhibit, failure of communication between a lawyer and a witness, excusing a juror and seating an alternate, and so on. Nothing spectacular occurs when electronic equipment fails. If backup equipment is available, the proceeding goes on as before. If not, the traditional methods using paper copies reappear.

Jurors are not particularly affected by technology failures unless the court and lawyers are anxious about it. Everyone knows that occasionally equipment does not function, and the normal expectation is that after the proper repairs the equipment will start functioning again, so there is nothing to worry about.

The effects of most equipment failures are ameliorated immedi-

ately by either backup or redundancy. The most important factor in this regard is adequate planning. Management by the court can ensure this happens. For example, one of the very few components that can fail on an evidence camera or projector is a light bulb. If this is courtroom equipment, the court staff should have a spare on hand. If it is equipment brought to the courtroom by a lawyer, the prudent lawyer will have a spare bulb within reach. Another common occurrence is an occasional computer crash. A backup of all the files on an external disk assures that the lawyer will be able to recover quickly. A less likely example is a monitor failure, in which case a standard overhead projector on which the lawyers put acetate transparencies can serve as a temporary backup. This is also a potential backup if the evidence camera or projector goes down.

Many potential failures can be avoided, particularly when lawyers bring equipment to the courtroom, by allowing adequate time for set up and testing. Sometimes equipment does not work when connected to other equipment. A laptop may fail to transmit images to a projector that is different from the one the lawyer customarily uses. Pretrial testing and practice in the courtroom should overcome most of these difficulties. Obtaining representations from the lawyers about installation, testing, compatibility, reliability, and positioning of equipment also helps focus the lawyers on preparation.

Rule 102 – Purpose and Construction

These rules shall be construed to secure fairness in administration, elimination of unjustifiable expense and delay, and promotion of growth and development of the law of evidence to the end that the truth may be ascertained and proceedings justly determined.

Rule 611(a) – Control by court

The court shall exercise reasonable control over the mode and order of interrogating witnesses and presenting evidence so as to (1) make the interrogation and presentation effective for the ascertainment of truth, (2) avoid needless consumption of time, and (3) protect witnesses from harassment or undue embarrassment.

Guidance from the rules

The Federal Rules of Evidence offer only the broadest guidance with respect to the new methods and techniques brought to the courts along with new technology. The policy requirements most often applied to illustrative aids are found in Rule 102 and Rule 611(a). Rule 102 invites judges to allow new forms of displays that help develop better juror understanding of the evidence and move trials along more efficiently. Rule 611(a) asks only that in exercising their discretion, judges be mindful of whether the illustrative aids brought to the courtroom by lawyers are effective for the ascertainment of truth. As the use of illustrative aids grew enormously, the rules remained

focused on evidence, not illustrative aids, and the use of the new technology remained committed to the court's broad discretion.

In the early 1950s, California lawyers first brought blackboards into the courtroom and created instant visuals by writing with chalk as they talked. Flip charts balanced precariously on three-legged easels soon followed. Large exhibits propped on easels began to make substantial contributions by the mid-1970s when developments in the technology for printing enlargements in full color brought these exhibits into a reasonable price range. And in the 1980s large screen television monitors made available video presentations on laser disks controlled by bar codes.

The concept of the "illustrative aid" expanded generously alongside these developments. It came to be defined as a visual display for the purpose of assisting a witness in presenting or the jury in understanding the testimony. The requirements under Rule 901, when used by analogy for illustrative aids, generally posed no barrier to their use. The standard foundation came to be an exchange between lawyer and witness along these lines.

Question: "Directing your attention to what has been marked as Exhibit 17, do you recognize that?"

Answer: "Yes, it is a series of slides about my work on the project."

Question: "Would the use of Exhibit 17 assist you in explaining your work on the project to the jury?"

Answer: "Yes."

The illustrative aid would then be brought out, put on the easel or television screen, and the witness would explain it. Because these illustrative aids were "set pieces," so to speak, and could not be readily altered, they had to be prepared well in advance of trial and usually involved considerable time and expense. They rested relatively demurely in one place in the courtroom, and attention was directed at them from time to time. The circumstances dictated restraint.

Digital technology changed all that. The new digital monitors attract, and indeed demand, attention for the same reasons most ju-

Rule 901 – Requirement of authentication or identification

(a) General provision. The requirement of authentication or identification as a condition precedent to admissibility is satisfied by evidence sufficient to support a finding that the matter in question is what its proponent claims.

rors like to watch television. The new powerful laptops meant that hundreds of potential illustrative aids could be brought to court in one small box. Advances in presentation software gave lawyers the capability to create illustrative aids at very low cost and to change them at any time with virtually no attendant expense. The vastly expanded capacity to display concepts, themes, and theories on brilliantly colored and attention-demanding screens caused lawyers to focus considerable ingenuity on illustrative aids, and these exhibits muscled their way to the front lines. Documents are still admitted in evidence. But jurors learn what they mean through illustrative aids. A page of text is enlarged, colored boxes appear to focus attention on the point to be made, callouts pull the relevant lines from their setting in a paragraph and enlarge them even more. Photographs are still admitted in evidence. But when they appear on the screen, they are cropped, labeled, outfitted with directional arrows, and meshed into the proponent's case theory.

Rule 403. Although relevant, evidence may be excluded if its probative value is substantially outweighed by the danger of unfair prejudice, confusion of the issues, or misleading the jury, or by considerations of undue delay, waste of time, or needless presentation of cumulative evidence.

Courts sometimes use the formulation of Rule 403 in dealing with objections to illustrative aids. Rule 403 allows the exclusion of otherwise admissible evidence. Illustrative aids normally cannot qualify as evidence; they have nothing to do with whether the existence of any fact of consequence to the determination of the action is more or less probable. They are solely for the purpose of helping the witness convey information to the jury in an understandable fashion. If an illustrative aid could be excluded under Rule 403 because its prejudicial effect substantially outweighs its value, then it should be excluded. However, illustrative aids can be excluded, even if the prejudicial effect is not so substantial as to reach the traditional threshold of Rule 403, because they are supposed to be useful and cannot serve that purpose if they do not convey information clearly without attendant distraction, unnecessary emphasis, or needless cumulative display.

Other rules give judges few benchmarks on how to apply principles of fairness to labels, text treatments, colors, motion, sound, positioning, intervals, and repetition in illustrative aids—all of which

can be made a legitimate part of the jurors' task of learning about the case facts, and all of which can also be stretched well beyond the bounds of fairness.

Parts II, III, and IV of this guide offer practical suggestions with respect to judicial management of courtroom technology and its many manifestations in the discovery, pretrial, and trial processes.