Index - Conference Room Guidelines

SNL Conference Room Guidelines Development Team

Michelle Appelman
Matthew Brito
Laurence J. Chavez
Vin N. Davis
David H. Dirks
Laura D. Draelos
Kevin Fahey
Diane Gomes
Richard Goodson
Mick Gorospe
Gary Hoe
Stephen James
Paul Keller
Ed Williams
Steven Koffman
Maggie Lucero
Carlos S Medrano
Bob Fischer
Jay Peterson
Camille M. Reyes
Thomas Rodgers
Patsy K. Rowland
Paul R. Smith
John J. Thayer
Mitch Tillison
Carlos J. Trujillo
Dan Williams

Sandia National Laboratories
Conference Room Guidelines

A. Introduction

1. The Conference Room Guidelines are not rigid standards that are provided to the design community for strict adherence to requirements or specifications. The Guidelines are generally accepted principals and standards that will be used by designers to develop documents for the construction of conference rooms at Sandia National Laboratories (SNL).

   It is an important distinction to understand that these published standards will be used as guidelines only. There are many unique and diverse groups here at SNL. We must appreciate that the difference will drive the design of a facility. Size, shape, orientation, colors and the operational environment of a building will determine the location, adjacency and function of the conference room within that facility. A standard conference room plan will not provide the building with a room that is in context with the building design. A standard set of room finishes and colors, a standard lighting layout, etc, etc; Guidelines allow the Architects and Engineers the design freedom to meet minimum performance standards and equipment preferences that conform to SNL requirements. The A/E can still develop the Conference Rooms to meet their customer's programmatic requirements and the buildings functional and aesthetic intent.

2. The SNL Conference Room Guidelines are needed because there are many different approaches and methods for a customer at SNL to have a conference room designed and constructed within an existing building. There is no one set of criteria available for outside A/E firms to design a standard conference room in a new facility. It is the desire of SNL management to provide guidance to everyone wishing to develop a conference room such that the resulting facility meets some basic and minimum standards.

B. General Definitions, the Development Process & Programming

1. Types and Definitions (Security and Management classifications); to consistently understand the references that will be described in these Guidelines the terminology will be important.

   a. Standard Conference Room: any conference room used for the purpose of holding a meeting or discussion between two or more persons. A prearranged meeting for consultation or exchange of information or discussion (especially one with a formal agenda)

b. Corporate Conference Rooms: any conference room that currently exist throughout the SNL facility that meet the guidelines for corporate conference space and is available for scheduling by any organization. This conference room space is supported by the Facilities Organization and is not restricted in its scheduling ability.

c. Classified Conference Room: any conference room where classified information is discussed on a recurring basis.

d. Video Conference Rooms: any conference room that has been designed or outfitted with the capability to provide videoconferencing and other visualization environments and the systems needed to support them.

e. Classified Videoconferencing Room: (Tempest requirements) combination of definitions above for a conference room where classified information is discussed on a recurring basis.

f. Vaults & Vault-type rooms (VTR): secure rooms used for either storage of classified material or as office space where classified work is performed. VTRs are NOT considered conference rooms and will be addressed under other specifications and guidelines. A conference room that happens to be situated inside a VTR can hold classified meetings.

g. Customer: The person owning or requesting the conference room or their designated representative.

h. Project Manager/Designer: The person responsible for the successful implementation and coordination of the design team and oversight of the construction effort required to do the work.

2. Using Conference Room Classifications. To appreciate and use these definitions the designer and the customer must establish at the beginning of the design the specific type(s) of conference room that is required and/or desired.

a. A conference room can be all of the above or only one or two, they are not mutually exclusive. : It is the intent of these Guidelines to promote the development of consistent standards for all conference room such that the conversion of any room originally designed to meet minimum standards can be modified to meet other classification requirements with minimum renovation to the basic construction of the room.

b. Conference room development process and programming: As with any design a proven way to develop a successful solution is to have all the information, concepts, facts, goals and objectives identified prior to commencing the design. In Architectural terms this is process is defined as the programming phase of the project. The programming effort can be easy or complicated depending upon the

project requirements, the condition of the facility, location of the room and the number of support personal required to have input into the design decisions.

- Gather the initial data, and develop the criteria using these guidelines. A follow up meeting between the designers (Project Manager) and the customer will develop an estimate of cost (budget) and outline a realistic schedule.

- The PM should then identify all of the supporting personal that may be required for the conference room design. The PM should then convene a design meeting with all stakeholders and the customer. This planned meeting, with a predetermined agenda, will place all the needs of the Conference Room design on the table so a coordinated effort can be initiated and a collaborative design developed that takes all the requirements of the Conference Room into consideration. The intent is to do it right the first time with minimal rework and maximum coordination.

- Since the needs of a specific conference room can be simple or complex the extent of this effort should be considered when developing the schedule and the budget. Time and cost need to be provided for the Design effort.

3. Conference Room Capabilities: The intent of these Guidelines is to promote the development of consistent standards for all conference room such that the conversion of any room originally designed to meet minimum standards can be modified to meet the upgraded requirements with minimum renovation to the basic construction of the room.

    a. Standard conference rooms must meet minimum standards irregardless of the type of building that the conference room is located within. The space will meet the functional needs of a conference room for privacy, lighting, comfort, communication and the needs of the customer. The size of the room will be based upon the available space at that location in the overall facility design. It will meet occupancy minimum code requirements. Accessories, furniture and equipment will be identified in subsequent sections of the Guidelines.

    b. The objective of providing a design for Corporate Conference Rooms is to standardize conference rooms and maintain that standard as a service to the Laboratories. These conference rooms will provide space that meets typical conferencing needs in a consistent manner.

    c. Audio Visual components of conference rooms will be considered as minimum requirements. If the actual equipment specified for project the time of construction does not fall within the budget then provisions for future installation will be incorporated into the room construction.

d. Providing Video Conferencing systems are by far the most complicated of capabilities that can be designed into conference rooms. These systems are currently being installed in several existing conference rooms, private offices as well as designed into new facilities. The requirements are considerable and must meet specific design parameters to function properly within the Network. These Guidelines will provide a description of the design requirements for Video Conferencing system in subsequent sections. For details contact representatives from Org. 8974 www.sandia.gov/coco/services/room.html

e. Classified Conference Rooms having walls, floors, ceilings and doors of offices or rooms constituting area perimeters where classified information is discussed, handled or processed on a recurring basis shall be constructed of materials of low sound conductivity, and shall be acoustically treated so as to prevent a person outside the room with reasonable access to the wall from overhearing a conversation at normal level within the room without the use of hearing instruments or equipment. Specific design guidelines (DCID 6/9 – SCIF) will be provided in subsequent sections. Contact Dept. 00030-1 TSCM (Technical Surveillance Countermeasures) (505) 844-4047

4. Corporate Conference Room Criteria: Conference Rooms will only be considered for corporate space provided the following criteria is met:

- Room must be directly available through the Web Conference Room Scheduler to schedule.
- Room must be larger than 300 square feet.
- Room will be beneficial to the corporation as a whole based on location, size and accessibility.
- Space and Real Estate Management Department, Organization 10854, must approve the room as corporate space prior to acceptance as corporate space.
- Space and Real Estate Management will periodically evaluate corporate conference space to determine the appropriate amount required for site use based on the occupancy of buildings, location and utilization of the rooms.
- Corporate Space budget pays for the space charges for these rooms only. Space and Real Estate Management will not be responsible for the cost to existing furnishings or for acquiring additional furnishings or other associated equipment for these rooms.

5. Design Parameters as part of the programming effort will be governed by the following requirements:

a. Understand the functional and operational requirements of the customer for this conference room. Know the intended result of your conference room design effort and communicate this often to the design team and the customer. Use this intended result as the bench mark criteria for making design decisions during the project development.

- Do not lose sight of the budget and the project schedule. These items also are design parameters for which the success of the project will be considered.
- Location within the existing facility must be taken into account to assess the functional adjacency to the conference room. To resolve and mitigate any adjacencies issues relative to access, sound attenuation either from the outside in or inside out for security issues may be required.
- Utilization of the proposed space in an existing situation for the purpose of creating a conference room to meet the customer's requirements may be required. Issues relating to building structure, Mechanical, Electrical and Fire Protection system capacities must be addressed. The co-occupancy consideration during the construction, relocation of the existing space function or occupants and the access and egress must be considered.
- The proposed number of occupants that will use the conference room may be limited by the Code. The potential need for more than one exit and the location of that exit must be considered at the beginning of the design.
- For new construction many of the same issues need to be addressed but the inherent ability to manipulate a new design should present fewer problems.

b. Code compliance will help determine many of the design parameters prior to the collaborative design meeting. Currently SNL is following the 2003 IBC and the 2003 NFPA Life Safety 101 Codes for facility design. Review UFAS for the accessibility requirements.

c. The actual conference room configuration and layout is critical for the successful design and use of the room. Existing buildings can leave the designers with less than desirer able room shapes to configure furniture for effective communications, locate marker boards, provide useful lighting, develop reasonable audio visual capability and eventually lead to problematic Video conferencing. Subsequent sections of these guidelines will discuss the preferred room sizes or ratios to avoid these and other design problems.

C. Architectural/Engineering Design & Construction Requirements

1. Architectural / Structural

a. Walls; Partition walls of conference rooms will be constructed of metal studs and gypsum wall board. The SNL design requirement is for all conference room walls to be constructed with sound attenuating batts. To provide all conference room partition walls with the capability to meet security requirements for sound attenuation (STC45) and classified conversation (amplified sound requires an STC50). The minimum standard for conference room partition wall system construction will be equal to Underwriter's Laboratories U465 w/ 3-31/2" SAFB in the cavity – SA870717. This constitutes a 1 hr, fire rated partition with an STC 49. The partition walls shall be extended to the deck above.

b. Doors: the number and size of doors in and out of conference rooms are determined by current code requirements. Current requirements indicate that one standard size door (3-0x7-0), swinging out of the room in the direction of exit, is required for conference rooms less than 750 square feet. Other conditions and unique room configurations need to be researched by the designer to determine if additional doors are required. All doors and door hardware associated with the conference room need to comply with code exiting requirements. SNL security access control and SNL Facilities Construction Specifications Section 08710 Door Hardware, room access and signage. All doors shall be solid-core wood or sound insulated hollow metal in hollow metal frames with perimeter sound seals.

c. Floors: Floors are to be a minimum of 4" thick concrete slabs with few penetrations. Second or other levels above grade shall be constructed of metal floor decking with concrete or concrete structural floor systems. Solid plywood floors at least ¾" thick that may be associated with Mobile Offices are considered acceptable.
    - It is preferable to core floors for conduit runs from tables to racks
    - Where coring is not an option, "speed bumps" maybe considered

d. Ceilings: ceilings systems shall be acoustically treated. Suspended ceiling grid systems with lay-in acoustical panels shall be provided. Suspended gypsum board ceiling systems can be used if they are treated with acoustical panels. For projects that included multimedia systems it is very important to coordinate HVAC, conduit, lights, speakers, ceiling microphones, ceiling mounted cameras and fire protection sprinklers. The lighting grid location in Videoconference rooms is used to position ceiling items relative to the table position below. The position shown for ceiling mounted items, especially the document camera, play a crucial role regarding its function.

e. Acoustics: Transmission of sound through the partition walls of a standard conference room shall have a minimum STC 45 rating. The sound control within the conference room will be influenced by the finish materials. A suspended grid ceiling system with acoustical lay-in panels can be an effective method to control the sound levels within the room. When the majority of the grid is used to provide lighting, HVAC supply and return diffusers, speakers and other equipment additional sound control should be provided. Carpet shall be specified for the flooring unless the anticipated use of the space would dictate an alternative material. Wall treatments such as Sound-Soak can be applied to any of the walls inside the room. If acoustic materials are required on the walls, specify those that have a flame-spread rating of 25 or less and smoke-development rating of 50 or less. The use of background noise generation systems (white noise) is not encouraged. Other sections of the guidelines will address specific acoustical needs of special systems. See C.10. Video Conference Systems.

f. Windows treatments; The design of windows in conference rooms is not recommended, but sometimes programmatic requirements or existing conditions will take precedence. Windows in conference rooms must be provided with window treatments (mini-blinds, blackout shades or other devices to control light into the room. This is a critical issue for video projection systems and Videoconferencing (LCD or Plasma) screens. Windows in classified conference rooms need to comply with the same STC45 or STC50 rating as the partition or exterior wall system requirements.

2. Mechanical

a. HVAC: The heating, ventilating and air conditioning guidelines for conference rooms are critical factors in the continuous comfort of the occupants. These systems also contribute to the reliability in useful life of the equipment. The system design is governed by the International Mechanical Code and the ASHRAE Standards. All Mechanical Systems and components shall conform to the SNL Standard Specifications Div 15000.
www.sandia.gov/engstds/spec_index.html
Designer and Engineer must coordinate the location and size of all ceiling supply and return diffusers with lighting layout plan, conference room ceiling mounted equipment and the architectural reflected ceiling plan.
   - The normal temperature range of a conference room shall be 68-72 degrees. The relative humidity within a conference room is not usually an important factor for consideration, but sometimes unique equipment or operational procedures may impact the design requirements.
   - Minimum air flow and air changes for conference rooms are ___.
   - The acoustical maximum of the supply air diffusers are 65DB
   - The location of the room thermostats should be coordinated to avoid any zone issues or conference room equipment exhaust fans that may directly influence temperature.
   - Ductwork or air grilles that exceed 96 square inches that penetrate the walls, floors, or ceiling space must have securing bars or screens in classified conference rooms.
   - Pipe penetrations into a SCIF must have dielectric unions to stop sound transmission. See SCIF requirements

b. HVAC considerations for Videoconferencing
   - Design for high volume, low velocity air flow with acoustic treatment in flow ducts that service the room
   - HVAC tuning plays a vital role in system performance due to the distribution of microphones in the room. In some cases, ceiling mounted microphones are used. HVAC blowing across a ceiling microphone, while inaudible in the room, will create a loud roar in the audio sent to the far end conference room.
   - When specifying ducts and diffusers the target for videoconferencing rooms is NC-35 or lower.

c. Plumbing: The plumbing for conference rooms shall be limited to programmatic requirements for a kitchen or break area within the room. Once those needs have been established, then sinks, ice makers, coffee machines and refrigerators will be provided with the required supply lines and drains. In existing locations that do not have water lines or drains reasonably close to the proposed kitchen, the cost becomes prohibitive and providing those services are not recommended. Pipe penetrations into a SCIF must have dielectric unions to stop sound transmission. See SCIF requirements

d. Fire Protection: The fire protection requirements for conference rooms are governed by NFPA 13, NFPA 72 and NFPA 101. Designer and Engineer must coordinate the location and size of all sprinkler heads with lighting layout plan, conference room ceiling mounted equipment and the architectural reflected ceiling plan. In existing buildings the size and location of main supply piping should be identified and avoided if possible in the layout of the ceiling mounted lights and equipment. Relocation of main fire protection supply lines is a cost factor not to be overlooked. Pipe penetrations into a SCIF must have dielectric unions to stop sound transmission. See SCIF requirements

3. Electrical: The electrical requirements for conference rooms range from the basic elements of power and lighting to the specific needs of the security systems, alarms and the control of equipment and associated systems. The need to adhere to established SNL Standards & Specifications and the National Electric Code in the design and construction of these rooms are critical for the continued operation and maintainability of the facilities at SNL. Pipe penetrations into a SCIF must have dielectric unions to stop sound transmission. See SCIF requirements.
   All Electrical Installations shall meet the following codes & standards:
   - NFPA 70 (National Electric Code) – latest edition
   - SNL Design Manual www.sandia.gov/engstds/dsnmanual.html
   - SNL Standard Construction Specification Div.16000 www.sandia.gov/engstds/spec_index.html

   a. Power: The amount and types of power that will be needed for the complete operation of the conference must be established at the beginning of the design. Provide power as required by the individual conference room design. As a minimum provide receptacles flush in the floor (when possible) beneath conference room table locations and circuit in overhead ceiling space for suspended projection equipment. Avoid panelboards inside a conference room.

   b. Power considerations for Videoconferencing: Electrical for larger video conference systems require special power considerations for grounding and power distribution. This is done to minimize noise artifacts in the video and audio signals.
      - Power for displays and equipment must be served from the same power distribution panel and from the same power phase. Includes power to table outlets serving computers.

- Conduit used to carry multimedia (microphones, computer, DVD, etc.) signals in classified video conference rooms require attention to separation and grouping of signals. In general all conduit carrying computer (VGA) connections must be run individually since both classified and unclassified computers maybe simultaneously in a conference. Conduit carrying microphones signals can be grouped as room logistics allow. Separation between red, black and green conduit is a minimum of 2".

c. Lighting: The correct number of fixtures (required light level) and location of the overhead lighting within the conference room will directly impact the comfort and function of the room. The programmed and potential use of the room for communication will provide the designer with the criteria for the type and placement of the fixtures. Specifying SNL standard light fixtures with fluorescent lamps is recommended. The use of non standard light fixtures needs to be reviewed and approved prior to completion of the design.
    - Lay in 2x4 dimmable fluorescent fixtures for general lighting
    - Lamps to be 4' T8 (F32T8SP35 per specification 16501)
    - Recessed downlights to have compact fluorescent bulbs
    - Wall wash lay-in fixtures if needed
    - Wall mounted light fixtures if needed
    - Location of Controlled dimmers near door or table control
    - Emergency lighting shall be installed in all conference rooms. Use emergency lighting that only comes on in the event of a power failure

d. Lighting for Video Conferencing: Lighting will determine the quality of image from your room. Too little light not only will cause a dark image but due to the nature of video compression will cause a distorted image at the far-end. Light level, light direction, color temperature, and table color play important roles in video image quality. The requirements for achieving satisfactory image quality in a manner consistent with a comfortable business meeting environment are:
    - Do not mix fluorescent and incandescent lighting in the same room. The result will be green shadows due to the variation in color temperature.
    - Light intensity of 85-95 vertical foot candles (VFC) at seated eye level is required.
    - Light distribution must be directed toward the participants and must be uniform over the entire seating area to provide a video image having uniform brightness free of "hot spots", glare and shadows.
    - Ambient light spill on the front wall camera and monitor area is very low in order to maintain maximum picture contrast on the video monitors.
    - Light falling on the back walls must be separately adjustable in order to set the best balance of foreground to background light.

- Standard fluorescent fixtures are designed to direct most of the light directly down, which can give rise to unpleasant or unflattering lighting of participants as viewed on a video monitor.
- Lights should not be positioned directly over the participant's heads. Use a commercially available fluorescent videoconferencing-type light instrument which will provide directional control of the light on the participants and a very soft, shadow less quality.
- An angle of at least 45 degree from the light source to the participant is recommended, but only in the direction of the participant.
- Emergency lighting shall be installed in all conference rooms. Use emergency lighting that only comes on in the event of a power failure.

e. Security Access Control: Access control into a conference room can be determined by the customer, with final determination by physical security. Conference rooms where classified information is discussed on a recurring or routine basis shall provide for security access control.
   - Door Hardware
   - Badge swipe access
   - Signage

f. Alarms: The need for alarm systems within the room or at access doors shall be determined by code, programmatic requirements and security.

g. Fire Alarms: Occupant notification devices (strobes) are required in all conference rooms that have a calculated occupant load of ten (10) or more. The current code calculation would be 150 sf / 15sf per person = 10 persons.

4. Communications: Communication requirements are a significant concern for conference room design. Classified (red) and Non-Classified (black) need to be addressed prior to the start of design. The customer should provide that direction with the assistance of security. This determination will impact all of the communication systems as well as the overall cost of the project.
   a. Telephone: See SNL Standard Spec Div16000 www.sandia.gov/engstds/spec_index.html
   b. Data
      - SON (Sandia Open Network), SRN (Sandia Restricted Network) for Unclassified
      - SRN, SCN (Sandia Classified Network) for Classified

   c. Networks
      - ISDN (Integrated Services Digital Network): Copper or fiber or both depending upon requirements
      - Minimum of 3 ISDN BRI lines

   d. Classified: Requires Security IDT review of room and system design.

- Minimum separations between red, black and common components.
- Restrictions on use of flex conduit and number of bends
- PTS (Protected Transmission Systems) inspections required. All conduit runs must be inspected by PTS before.

5. Communications: Refer to The Videoconferencing Guide and representatives from Org. 8974 www.sandia.gov/coco/services/room.html for a typical high-end system that may include the following features:

    - Large Dual Displays
    - Multi-Site Features (up to 4 sites depending on Network Capabilities)
    - PC Presentation mode with XGA input and SVGA output
    - Echo Cancellation
    - Camera Presets
    - Ceiling Microphone systems
    - Custom Interface Options
    - Additional cameras
    - Document camera (table or overhead)
    - Computer (Macintosh or PC) interface
    - Native resolution display of computer generated content
    - Native resolution display of computer content at far-end
    - VCR (Record and/or play)/DVD/CD
    - Phone Add On

    a. Network Connectivity – Refer to The Videoconferencing Guide for the following items:
        - ISDN H.320
        - IP H.323
        - 100 Mbps Switched Circuit
        - Close to edge router
        - Routers that recognize TOS or IP Precedence and pass RTP
        - Virtual Private Network (VPN) capability where required
        - IPsec and DES encryption
        - Firewall policies that allow for
        - H.323 proxy Servers
        - Application Level Gateway (H.323 protocol aware)

6. Special systems
    a. Lighting Controls; Dimmers (Lutron), RS232 Port
    b. Audio controls: Speakers and Microphones
    c. Fire Alarm Strobe required inside conference rooms, see SNL Spec 13852.

7. Finishes
    a. Walls and wall treatments: In general all conference room walls will be sheetrock that has been taped and textured.

- A light texture such as “orange peel “is recommended.
- The paint finish should follow SNL standards for interior 2 coat latex semi-gloss paint.
- When no specific color is required by the customer, the standard Sherwin Williams - Toque SW 7003(white) will be used.

b. Wall finishes in videoconference rooms must be simple so as not to create unnecessary information for the codec process
    - It is also imperative that the background color be the proper color saturation and reflectance values (no dark colors)
    - In the corners of the room, the designer should consider providing angled panels “if possible” to prevent dark areas on camera.

c. Wall treatments: Materials applied to finished walls maybe considered for sound control. Sound absorption panels maybe considered on some walls to minimize acoustic reflections. Fabrics and wall coverings can also be introduced as wall finishes providing they do not act as noise reflectors (or enhancers). If acoustic materials are required on the walls, specify those that have a flame-spread rating of 25 or less and smoke-development rating of 50 or less.

d. Wall treatments for videoconferencing: Ambient noise needs to be minimized and controlled within a videoconferencing environment.
    - Reverberation is a result of sound that bounces or reflects off walls and surfaces in a room. Sound absorption panels should be used on 50% of the wall surface to minimize acoustic reflections. If acoustic materials are required on the walls, specify those that have a flame-spread rating of 25 or less and smoke-development rating of 50 or less.

e. Floors and base: The flooring recommended for conference rooms shall be cut pile carpet, either broadloom of carpet tiles. When specifying carpet tiles SNL standard colors and styles should be considered for ease of replacement and maintenance. Standard 4” vinyl base is recommended, color to be selected by the designer. Avoid the use of hard surfaces such as ceramic or quarry tile. The use of VCT should only be considered if the use of the conference room also includes lab or wet type functions where the installation of carpet is not recommended.

f. Ceiling systems and panels: Conference room ceilings are usually suspended grid systems with acoustical lay-in ceiling panels. The panels should be a fibrous perforated type that contributes to good sound attenuation. The size and style of the lay-in panels should be consistent with the overall building design. The use of 2x2 or 2x4 panels and grids sizing is recommended. The color of the ceiling panels shall be white to support the light reflective quality of the room or at least a light color if color is specified by the designer.

g. Colors: The use of color in conference rooms should be evaluated by the designer with care and the approval of the customer. The intended use of the room for

presentation and communication needs to be considered. Bright intense colors can be a distraction to activities and should be avoided. Neutral and muted colors can provide a welcome departure from the standard white walls. Colors and textures can be added to the walls with the addition of sound absorption panels. Videoconferencing rooms and the colors selected require additional consideration because of the way a camera picks up the surrounding colors. It is also imperative that the background color be the proper color saturation and reflectance values (no dark colors).

8. Equipment
    a. Projector Screens
        - Manual pull-down or automatic motorized
        - Wall/ceiling mounted
        - Recessed ceiling mounted
    b. Overhead Projectors
        - Visual presenter
        - Transparency projector
    c. Projectors
        - Table mount
        - Ceiling mount
    d. Marker and Tack boards
        - White/ceramic marker boards
        - Cork tack boards
        - Smart Marker boards (Polyvision)
    e. Electric print boards
    f. Food service
        - Coffee maker (by customer)
            - An occupancy-controlled power strip is required for the coffee brewer if the brewer will be unattended for a long period of time.
        - Microwave (by customer)
        - Refrigerator (by customer)
        - Icemaker (by customer)
        - Wet bar/sink: stainless steel w/ bar fixtures
        - Bottled water: space for dispenser and spare bottle racks
    g. Accessories (no flip charts and easels)
        - Dry erase markers
        - Erasers

9. Furniture & Furnishings

    a. Conference Room table: The designer should determine with the customer the size and location of the table (s) that will meet the needs of the potential occupants of the room. Location of the table within the room should be based upon the use, door location, marker boards, projector screens and size (proportion) of the room. Accessibility standards must be taken into consideration

by assuring enough circulation space around the table and access to the table. Table height shall be 32-34". Clearance between table w/chairs and wall shall be 36" min.

- Table should be moveable unless prewired for videoconferencing capabilities and fixed to floor mounted communication and power boxes.
- Table construction and finishes are TBD by the designer and the customer.

b. Conference room table for Videoconferencing: The shape of the table is a critical factor in the usefulness of the videoconference system. The object and chief benefit of videoconferencing are the same as actual face-to-face conferences - eye contact. This means the design of the table should allow for the closest focusing of the camera while including all the participants in the shot.
A modified oval or triangular shaped table is the best choice. This is because, from the camera's perspective, the conference attendees appear very close together while there is actually a comfortable distance between them.
It is important that the tabletop act as a reflector for fill light in the chin and the eye socket areas of the videoconference participants.

- Surface colors in the grays or very light wood grains.
- No cool or highly saturated colors.
- The surface should have a reflectance value of between 60% and 80%. Samples of acceptable materials and their reflectance characteristics are available upon request.
- Choose a table that positions the most people at the same distance from the camera.
- Special Considerations:
  Surface mounted or embedded
  Computer power, signal access and cable dressing

c. Conference Chairs & Side Chairs: The type and style of chairs specified for the conference room should be in keeping with the overall design. Budget and availability must fit within the cost and schedule for the project.

- Chairs can be a combination of swivel and adjustable and/or fixed height sled chairs that are stackable.
- Provide enough chairs to seat table occupants comfortably.
- Extra side chairs for others can be provided, but in no case should the project provide more chairs than exceeds the room occupancy limitations.
- Finishes are TDB by the designer. In videoconferencing rooms the colors selected will require additional consideration because of the way the camera picks up the surrounding colors. The background colors must be of the proper color saturation and reflectance values.

d. Counters and Cabinets: When the programming requires that the conference room incorporate a kitchen counter and base or wall cabinets, the arrangement of these

items in the room requires careful consideration. Discuss the needs of such items with the customer and find out to what extent they intend to make use of them. The recommendation is to minimize the built-in furniture (cabinets etc,) in conference rooms.

- "Custom" quality cabinet work as defined by the AWI will be the standard for SNL.
- Plastic laminate countertop and cabinet finish should be specified.
- Solid-surfacing material will be specified for all countertops that include sinks or wet areas

10. Video Conferencing Systems (for details see the Guide To Videoconferencing and Room Integration) Coordinate with ORG 8947 – and the CPA Coordinator www.sandia.gov/coco/services/room.html

    a. Videoconference systems vary in capability and application. Small group systems and desktop systems are virtual plug-and-play devices if network connectivity (either ISDN, IP or both) has been established. The implementation of large room systems requires greater care. Room acoustics, lighting, sound re-enforcement, display/projection, HVAC, seating, placement of tables and chairs, user interface and operation all must be accounted for.

    b. Network Connectivity (see Communication Section 5.a.)

    c. Service and maintenance: The design and installation using these standards and equipment will facilitate the ability to maintain the conference rooms. Spare parts and replacement equipment can be readily available.
    The Video Conferencing equipment supplier is responsible for the maintenance and warranty of the equipment, under their current contract, for a period of three (3) years. Currently the videoconferencing systems provider also is contracted for:
        - Replacement of defective components
        - Loan equipment (depending on agreement)
        - Network components, backbone and systems[1]
        - Onsite Technical Support Desk – (505) **845-2000**

    d. Special Room Considerations and Finishes: Facility preparation depends on the level of integration of the system to the facility. Costs are more expensive for a built-in system than for free standing systems[2]. The level of success for the function of the room depends on the acoustical noise levels, lighting, and layout of the room. These areas are treated exclusively during facility construction.
        - Minor room construction:
            - Acoustic treatment to existing walls (Flame spread rating)
            - Lighting fixtures
            - HVAC tuning

[1] Network contracts may be separate from room service and maintenance contracts
[2] Free-standing systems are sometimes referred to as "Roll-Abouts"

- Major room construction:
  - Acoustics; Analysis and design
  - Infrastructure (wall, floor, ceiling, etc.) treatment and considerations
  - Lighting; Analysis, design and implementation in a multi-purpose environment
  - HVAC; Design for high volume, low velocity air flow with acoustic treatment in flow ducts that service the room.
  - Power; Uninterruptible power source and power filtering

e. Space Considerations: It is important that the space chosen allow for easy access to the videoconferencing and audio/visual (A/V) equipment.
   - The entry to the room should not be on camera if possible.
   - It is also advisable to consider provision for an anteroom or reception area.
   - Outside walls with windows should be avoided.
   - Locations adjacent to noise producing areas such as kitchens, toilets, mechanical rooms, manufacturing plants, elevators and high traffic areas are not desirable.

f. Interior Finishes: The materials used in the videoconference room can have a great effect on the quality of the video. The two most important areas are tabletop materials and the material used for the background walls**.**

g. Lighting Considerations: Lighting will determine the quality of image from your room. Too little light not only will cause a dark image but due to the nature of video compression will cause a distorted image at the far-end. Light level, light direction, color temperature, and table color play important roles in video image quality.

h. Acoustics: Ambient noise in the room, reverberation and sound isolation (security) all contribute to the overall acoustical characteristics of a room. The audio system performance is determined, in large, by the room acoustics preparation. Quiet rooms allow a lower comfortable listening level. Non-reverberant rooms allow a higher listen level before echo. A quiet, non-reverberant room is the goal. Conference Rooms or Auditoriums that are regularly used for classified conversations shall have an STC50 rating.

   Ambient noise defines the "normal" room noise level or quiet state. Ambient noise is specified with a Noise Criteria (NC) value. Building contractors to specify fixtures such as HVAC diffusers and ducts use the NC. In general, the site must be free of serious or distracting acoustic problems such as noisy light ballasts, untreated high velocity HVAC ducts, structure-borne noise, noise from adjacent areas or equipment (elevators, soda machines, etc.).

Reverberation is a result of sound that bounces or reflects off walls and surfaces in a room. The reverb factor, call the RT60 value, is treated mainly by using specially designed panels which can be custom fitted, trimmed, and tuned on-site to meet the specific needs of the facility. Sound absorption panels should be used on 50% of the wall surface to minimize acoustic reflections. A room with less than 500 ms RT60 value is desirable for videoconference rooms.

Sound Isolation defines the ability of sound to pass through walls. Sound isolation prevents outside noise from entering the room whether from outside the building or adjacent rooms. It also defines the ability to isolate conversations within the room from being heard outside.

- Hard surfaces, such as windows, reflect sound and, therefore, must be avoided in videoconference rooms.
- There should be no HVAC ducting over the conference table. Ducts over the table may require relocation or at minimum, changing of the registers. Ducts may interfere with the optimal overhead camera mount for a graphics camera.
- Slab to slab walls are preferable.
- Carpet must be used in the conference room. All adjoining spaces, including above and below the conference room should also be carpeted.
- Avoid rooms near elevators or locations where structurally borne sounds are apparent.
- Solid wood or acoustically rated steel doors and frames should be used (50 STC) with perimeter gaskets and bottom drop seals.
- Hard surfaces, such as windows, reflect sound and, therefore, should be avoided in videoconference rooms.

D. Conference Room Commissioning

1. Commissioning: Commissioning is a quality-focused process for enhancing the delivery of a project. The process focuses on verifying and documenting that the facility and all its systems and assemblies are planned, designed, installed, tested, operated and maintained to meet Sandia National Laboratories (SNL) project requirements. Commissioning is the process of verification and documentation that insures all facility systems perform interactively in accordance with the design documentation and intent and in accordance with SNL operational needs.

   Refer to the following SNL Facilities Engineering & Architectural Standards Specifications for related work: www.sandia.gov/engstds/spec_index.html

   - Division 01 Section 01330 Submittal Procedures
   - Division 01 Section 01700 Contract Closeout
   - Division 01 Section 01810 Facility Commissioning Requirements

b. Submittals: Submittals as required in Section 01330.

c. Responsibilities: The Project Manager and the contractor shall incorporate commissioning activities, as defined in Section 01810, into the overall project schedule. The Contractor shall ensure that accurate record drawings are maintained by each trade at the job site throughout the project.

   - The Project Manager shall designate an individual to be responsible for coordinating commissioning activities with the customer. This requirement is intended to facilitate effective communication during the commissioning process.

d. System Testing and Coordination: When the equipment or systems are ready to be tested the test will be scheduled for a time mutually convenient to the contractor and all the subcontractors. SCIF certification may be required.

e. Operational and Maintenance Manuals: The Contractor and Subcontractors shall provide final O&M manuals and training materials to the Project manager prior to training. The O&Ms shall comply with SNL Standard Spec Section 01700 or as otherwise specified.

f. Operational Training: The Contractor shall develop a detailed agenda and a proposed training schedule and submit that to the Project manager for review, comment and approval.

g. Warranty: Prior to the end of the Contractors warranty period, the project manager will review operational issues reported by the maintenance personnel to ascertain whether the problems have construction defects as their root cause.

h. Project Closeout and acceptance: Follow the requirements of SNL Standard Specifications Section 01700 Contract Closeout modified for the extent and type of project.
   - The acceptance of the customer
   - As-built drawings or accurate red line mark ups from the Contractor.
   - As-built CADD files from the A/E

- END OF CONFERENCE ROOM GUIDELINES -