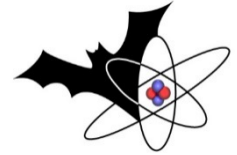




# ANS NCSD



## 2017 NCSD Topical

### Nuclear Criticality Safety Division Topical Meeting

September 10-15, 2017

Pecos River Village Conference Center (PRVCC)

Carlsbad, NM

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Data,  
Lessons Learned,  
And Recommendations  
To the organizers of future NCSD Topicals

Jef Lucchini, General Chair,  
And the Local Organizing Committee Chairs

# Attendance

- 101 participants

Lower participation than usual for NCSD Topical (~120-150).

*Possible reasons:* remoteness (and low attractiveness?) of Carlsbad, lack of nuclear criticality safety activities in the Carlsbad region, time of the conference (mid-September: end of Fiscal Year for National Labs; thus potential uncertainty in regards to travel approval).

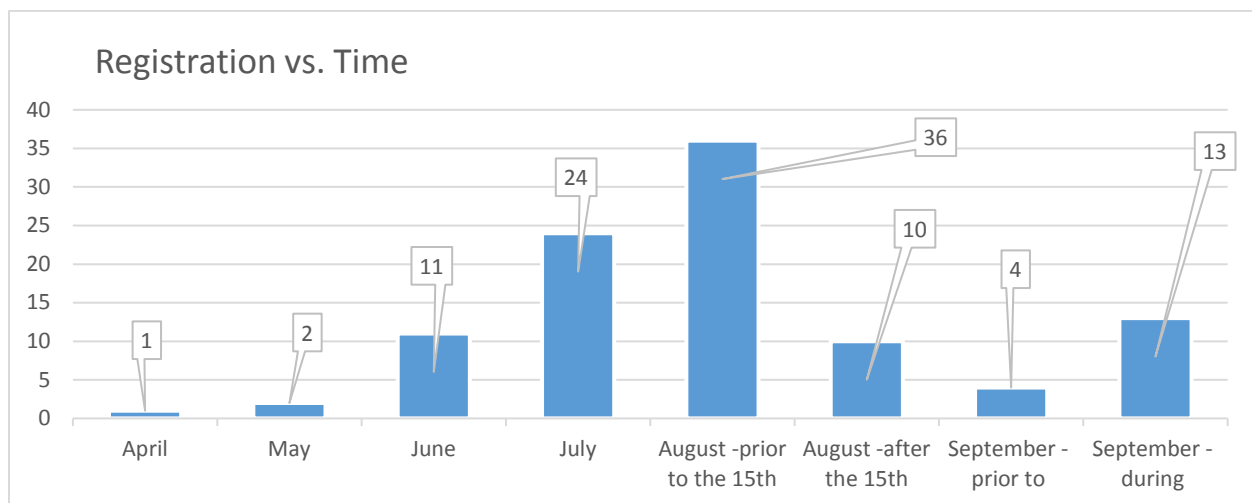
- 74 abstracts submitted - 61 full papers submitted

Drop of submission of full papers compared to abstracts.

*Reasons:* there existed a kind of “redundancy” between abstracts (~450 words) and full papers. Lack of time for authors to submit a full paper, despite extended deadlines.

*Recommendations:* Get rid of the abstracts! Streamline the process with one submission (full papers)!

- Registration



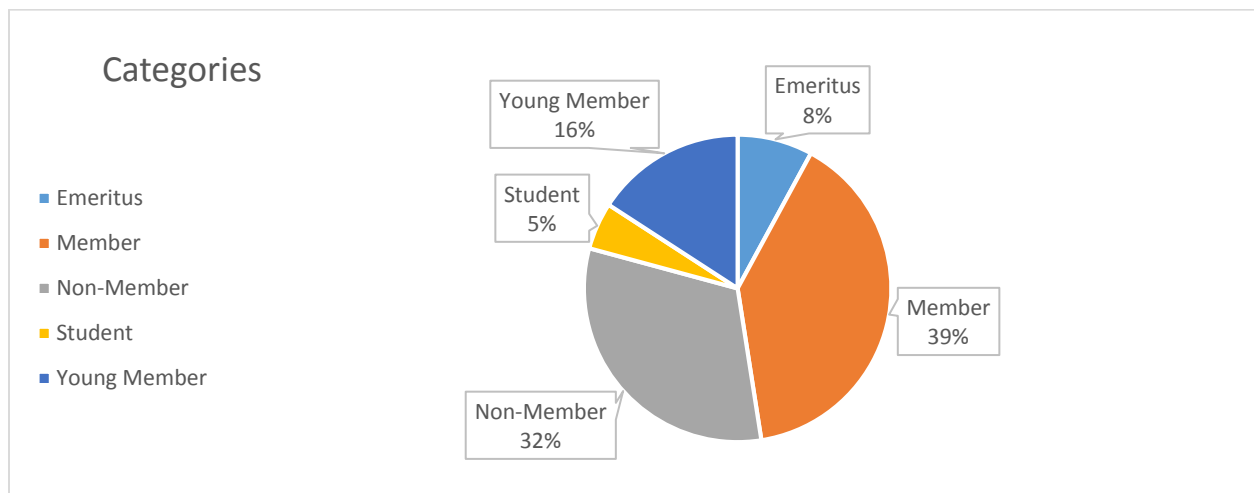
Late registration is a common trend. Despite a very “aggressive” campaign (emails sent almost on a monthly basis) to encourage early registrations (so the hotel room blocks would be filled, avoiding attrition), registrations picked up right before the early-bird fee deadline (August 15). Surprisingly good number of walking-ins (last minute registration) at the time of conference.

We used ANS services for registration. So we did not have to deal with money and foreign currencies, before and during the conference! The ANS online registration is excellent, and the ANS staff sends very detailed status reports periodically.

*Possible reasons for late registrations:* Late announcement of Keynote Speakers (July), issues with travel in some organizations...

*Recommendations:* Keep “reminding” people on a relatively frequent basis to register ASAP! Do not necessarily extend deadlines for registration: you get more money from late registrations! Use ANS for registration: very efficient and worry-free!

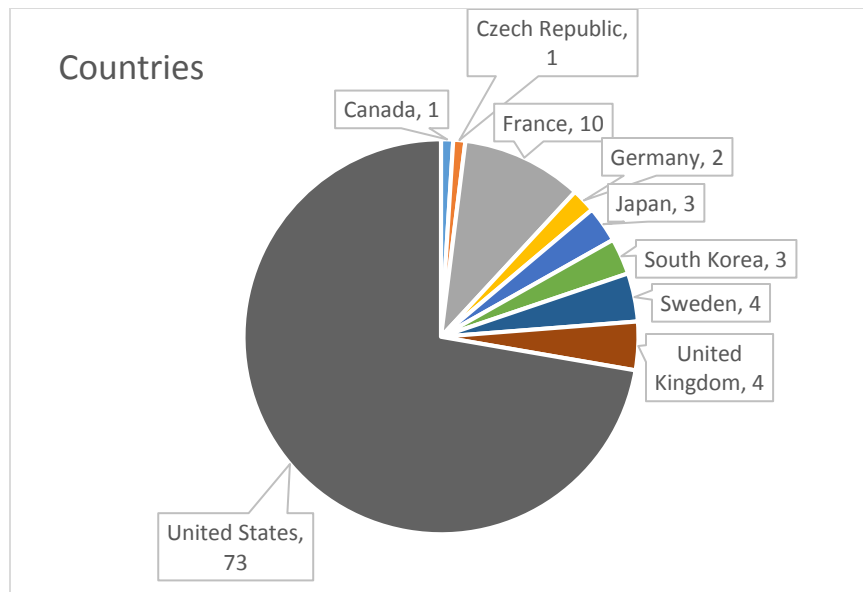
- Attendance spectrum



Relatively even share between ANS members and non-members. Low participation of students, despite of a special technical session dedicated to students and of two grants of \$1,700 each given for expenses.

*Possible reasons:* Insufficient advertisement of the student session, no local students in the nuclear field, absence of poster session, short deadlines for the student grants (3 weeks).

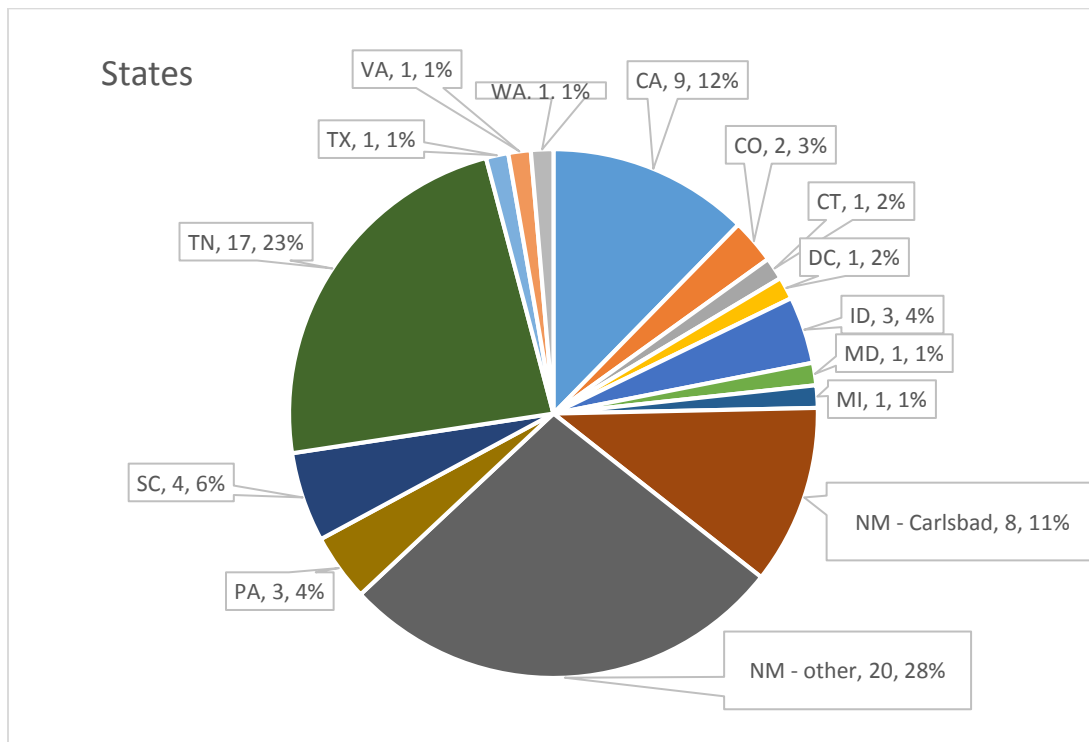
*Recommendation:* Reach out early to universities with a nuclear engineering program if you want a stronger student participation (we could have done this better!).



Exceptional foreign participation (27%) for a Topical meeting.

*Possible reasons:* Early on (~1 year in advance) and periodic (about every month) communication to possible foreign participants. Boosted by the foreign roots of both the Meeting General Chair and the NCSD Chair.

*Recommendations:* Do not hesitate to solicit foreign participation early on and consistently: Foreigners have, most of the time, a relatively easy way to travel, and most of them are non-ANS members (so higher registration income!).



Not surprisingly, the three major US places to send participants to the conference were the main contributors to NCSD:

- California, with mostly Lawrence Livermore National Lab (9 participants – 12% of the US participation),
- Tennessee, with mostly Oak Ridge National Laboratory (17 participants – 23% of the US participation),
- New Mexico, with mostly Los Alamos National Laboratory and Sandia National Laboratories (28 participants – 39% of US participation)

It is interesting to note that eight individuals from Carlsbad participated in the conference, even though criticality safety is not really a topic of the local community.

*Reason for relatively high local participation:* The General Chair made clear that any local members (including organizing committee chairs and... himself!) who wanted to actively participate in the meeting would have to register. No passes/invitations were granted. Local employers supported the participation of their employees to the meeting.

*Recommendations:* Enforce the rule that everyone has to register for the meeting in order to help during the event; get employers to support participation/attendance of their employees to the meeting; do not grant “free” invitations for attending the meeting, unless you receive money for the corresponding expenses.

## Accommodations

The conference was not held at a specific hotel.

Because Southeast New Mexico is a prosperous region for the oil & gas industry, the number of field workers in that industry can fluctuate drastically and rapidly depending on the drilling activity. Therefore, 10 months in advance, we decided to block 100 rooms in three different hotels in Carlsbad. That way, we secured enough rooms for our expected number of participants, and locked them at a relatively low rate (mostly within the Government per-diem). These were the advantages of this action, but there was a significant constraint to it.

Since these agreements were actually contracts signed by ANS, we could have faced some attritions/penalties if the rooms were not filled. Fortunately, we avoided any penalties of this kind, because we worked diligently with the hotels to revise/adjust the number of rooms. A few weeks prior to the beginning of the conference, since the registration numbers were below expectations, we reduced the number of blocked rooms without any problem.

*Recommendations:*

- Work with Paula Cappelletti (ANS) on hotel contracts and negotiations, but have someone at the location to visit and interact with the hotels and revise the number of blocked rooms if necessary, without any subsequent penalties.
- Insist on having people book their stay at the conference selected hotels, so you don’t have to pay penalties. Advertise those hotels in all communications (websites, call for papers, emails, etc.)

## Exhibit and Sponsorship

What should have been a major source of revenues did not work out that way. Even though a very detailed exhibit and sponsorship brochure was issued and broadly distributed 10 months before the event, the number of sponsors and exhibitors at the meeting was insufficient.

Three Carlsbad-based organizations financially supported the event:

1. Nuclear Waste Partnership (NWP), the operator of the WIPP.
2. New Mexico State University (NMSU), Carlsbad Environmental Monitoring & Research Center (CEMRC), the only local university research institution.
3. Los Alamos National Laboratory (LANL).

Through its Carlsbad Office, LANL helped to promote the conference. They paid for 2 employees (the General Chair, and the Registration Chair) to participate. Their \$10,000 grant was aimed at inviting renowned keynote speakers and helping students with their expenses to participate in the conference. Additionally, it also allowed LANL to have a booth at the conference.

Despite restless effort to reach out multiple potential sponsors from the Nuclear Criticality arena (past NCSD Topical sponsors, organizations of NCSD officers, etc.), we only received one sponsor from outside Carlsbad. Navarro accepted to give \$5,000, the biggest sponsorship money we got. The support of NSCD in terms of sponsorship was clearly missing.

Overall, we had 3 exhibitors (LANL, Navarro, NMSU/CEMRC), 3 sponsors (Navarro, \$5,000 - NMSU/CEMRC and NWP, \$2,500 each), and a generous grant (LANL) to pay for keynote speakers and students to come to the conference.

*Possible reasons:* Not an attractive venue, end of fiscal year, current economical context, etc.

*Recommendations:*

- Have a NCSD (committee) member in the local organization committee may help raising more funds.
- Explore all potential sources of sponsorship, particularly among local employers.

## Students Program

Despite a specific session dedicated to students, only 5 students registered to the meeting. This low participation does not reflect the effort made by the technical program committee and the local organizing committee to encourage participation from students enrolled in nuclear engineering programs across the US.

The LANL grant allowed the local organizing committee to “invite” two students to come to the conference. A student application was drafted and distributed widely to universities. This grant came late in the process (end of June), and the deadline was set to two weeks later. Only two applicants returned their applications, and... they were selected to participate to the conference. They received a \$1.7k stipend for their participation expenses.

*Comment:*

- It is certainly possible to have a stronger participation from students. Maybe a direct connection of the local organizing committee to a University would have been helpful.

## Finances

Budget estimations submitted to the ANS National Program Committee (NPC) for Calendar Placement and Preliminary Approval were overly conservative (on purpose), in order to account for unpredictable expenses. As a matter of fact, we systematically applied a 20 % contingency on those budget exercises (10 to 15% is common practice).

More than three quarters of the revenue was from registration (99 participants + 2 sponsors – see next three pages). “Real” sponsor money (not counting the LANL grant) accounted for 10.8% of the overall revenue, which was unexpectedly low.

More than two thirds of the total expenses came from three expense lines: food (31.5%), ANS services (22.4%), and facility rentals (14.5%).

A great deal of effort was made to keep all expenses as low as reasonably possible, and still provide a decent quality of service to the participants. Food and transportation were certainly the best examples of this golden rule (see Food and Transportation sections). ANS services included jump drives, Nuclear News advertisement, paper review system (EPRS), and registration. ANS proposed us additional services (website, publication, etc.) that we did not use, because we found cheaper deals.

Shortly after the end of the meeting, the Finance Chair needed to prepare the close-out budget for submission to the ANS, in order to receive the excess revenue share (25%) in a timely fashion, so that the numerous bills could be paid! However, two months after the end of the conference, the local section has not received their excess revenue share yet. This delay can be a problem when early bills need to be covered.

AMERICAN NUCLEAR SOCIETY CLASS I TOPICAL MEETING FINANCIAL PLAN												
TITLE OF MEETING					2017 NCSD Topical							
DATE OF MEETING					September 10-15, 2017							
LOCATION OF MEETING					Carlsbad, NM							
MEETING HOST (SECTION or ANS HQ)					Carlsbad section							
Date Original Budget Prepared: 05/13/2016					Submitted By: Jef Lucchini, General Chair							
Date Final Budget Approved:					Approved By:							
MEETING REVENUES												
	November 2016 ESTIMATED				June 2017 ESTIMATED				FINAL			
	#	FEE	AMOUNT	BASIS	#	FEE	AMOUNT	BASIS	#	FEE	AMOUNT	BASIS
REGISTRATIONS												
1 MEMBERS, early regist.	100	\$750	\$75,000		100	\$750	\$75,000		32	\$750	\$24,000	
2 MEMBERS, late regist.	0	\$850	\$0		0	\$850	\$0		7	\$850	\$5,950	
3 NONMEMBERS, early reg.	0	\$900	\$0		0	\$900	\$0		19	\$900	\$17,100	
4 NONMEMBERS, late reg.	0	\$1,000	\$0		0	\$1,000	\$0		11	\$1,000	\$11,000	
5 ONE-DAY MEMBER, early reg.	10	\$450	\$4,500		10	\$450	\$4,500		0	\$450	\$0	
6 ONE-DAY MEMBER, late reg	0	\$510	\$0		0	\$510	\$0		1	\$510	\$510	
7 ONE-DAY NONMEMBER, early reg.	0	\$540	\$0		0	\$550	\$0	See #C	0	\$550	\$0	
8 ONE-DAY NONMEMBER, late reg	0	\$600	\$0		0	\$610	\$0	See #D	0	\$610	\$0	
9 SPOUSE/GUEST	5	\$75	\$375		5	\$100	\$500	See #E	0	\$100	\$0	
10 STUDENT	5	\$200	\$1,000		5	\$200	\$1,000	See #A	3	\$200	\$600	
11 EMERITUS MEMBER	5	\$150	\$750		5	\$200	\$1,000	See #B	6	\$200	\$1,200	
EMERITUS MEMBER, late reg						\$300			2	\$300	\$600	
YOUNG MEMBERS, early regist.						\$600			12	\$600	\$7,200	
YOUNG MEMBERS, late reg						\$700			4	\$700	\$2,800	
STUDENT, late reg						\$300			2	\$300	\$600	
SUB TOTAL	125		\$81,625		125		\$82,000		99		\$71,560	
SPECIAL EVENTS												
12 LUNCHEON	0	\$0	\$0		0	\$0	\$0		0	\$0	\$0	
13 RECEPTION	0	\$0	\$0		0	\$0	\$0		4	\$25	\$100	
14 BANQUET	0	\$0	\$0		0	\$0	\$0		4	\$50	\$200	
15 SPOUSE/GUEST TOURS	0	\$0	\$0		0	\$0	\$0		2	\$25	\$50	
16 TECHNICAL TOURS	0	\$0	\$0		0	\$0	\$0		0	\$0	\$0	
17 OTHER EVENTS	10	\$50	\$500		10	\$50	\$500		2	\$50	\$100	See #J
SUB TOTAL			\$500				\$500		4		\$450	
OTHER REVENUE												
18 EXHIBITS	0	\$0	\$0		1	\$2,500	\$2,500	See #G	4	\$2,500	\$10,000	See #F
19 CONTRIBUTIONS	10	\$1,000	\$10,000		10	\$1,000	\$10,000	See #F	10	\$1,000	\$10,000	See #K
20 PROCEEDINGS SALES	0	\$0	\$0		0	\$250	\$0	See #H	0	\$250	\$0	
21 WORKSHOPS	0	\$0	\$0		0	\$0	\$0		29	\$40 or \$15	\$1,035	
SUB TOTAL			\$10,000				\$12,500				\$21,035	
TOTAL REVENUE			\$92,125				\$95,000				\$93,045	
REGISTRATION FEES INCLUDE: (List Items for each category)												
Full Registration		registration, reception, banquet, proceedings, <b>tour</b>										
One-Day Registration		what is provided with full registration that day										
Spouse/Guest Registration		reception, banquet, <b>Carlsbad Caverns excursion</b>										
Student Registration		registration, reception, banquet, proceedings, <b>tour</b>										
Emeritus Registration		registration, reception, banquet, proceedings, <b>tour</b>										
COMPLIMENTARY REGISTRATIONS PROVIDED: (List all that will be provided)												
registration, reception, banquet, proceedings, <b>tour or excursion</b>												
COMPLIMENTARY HOTEL ROOMS: (Define your policy for the use and distribution)												
none												
NOTES:												
#A	LANL grant											
#B	was \$150 in previous budget exercise - Goes up to \$300 for standard/onsite registration after Aug.15 (same for Students)											
#C	was \$540 in previous budget exercise											
#D	was \$600 in previous budget exercise											
#E	was \$75 in previous budget exercise											
#F	Achieved (Navarro \$5,000; NWP \$2,500; NMSU/CEMRC: \$2,500 )											
#G	One (LANL) received											
#H	updated, to match the final Publication Plan											
#J	Contribution from Blue House Bakery											
#K	LANL grant to invite Keynote Speakers and Students											



MEETING EXPENSES													
All line items must include the justification for the basis of the entry. Typical values are included for guidance. If the meeting host is contracting services, the values for the line items shall be left as \$0 and the total value of the contracts must be included in the contract section. The description of the contracted items shall be listed, and the contracts attached to the budget form. For all contracts, there shall be a formal contract bid and selection process, and ANS shall be solicited for the service.													
TITLE OF MEETING		2017 NCSD Topical											
DATE OF MEETING		September 10-15, 2017											
LOCATION OF MEETING		Carlsbad, NM											
MEETING HOST (SECTION or ANS HQ)		Carlsbad section											
Date Original Budget Prepared:		5/13/2016			Submitted By: Jef Lucchini, General Chair								
Date Final Budget Approved:					Approved By:								
ADMINISTRATION		November 2016 ESTIMATED			June 2017 ESTIMATED			FINAL					
		ESTIMATED BASIS			ESTIMATED BASIS			FINAL BASIS					
1 LOCAL COMMITTEE EXPENSES				\$300			\$300			\$525.95	See #V		
2 MEETING FLYERS/NOTICES				\$100			\$100			\$0.00			
3 CALL-FOR-PAPERS				\$100			\$100			\$0.00			
4 SHIPPING COSTS				\$300			\$300			\$67.77	See #R		
5 NUCLEAR NEWS ADVERTISING				\$2,300	2	812.5	\$1,975	See #A	2	812.5	\$1,975.00	See #R	
6 SIGNS AND POSTERS				\$500			\$500			\$0.00			
7 TICKETS AND BADGES		18.95	125	\$2,369	18.95	125	\$2,369		102	18.95	\$1,932.90	See #R	
8 ON-SITE ADMINISTRATION				\$500			\$500			\$0.00			
9 MEETING SPACE RENTAL				\$5,000			\$5,000			\$5,715.00	See#U		
MEETING WEB-SITE (includes On													
10 Line Registration)				\$3,000			\$500	See #H			\$343.50		
SUB TOTAL				\$14,469			\$11,644				\$10,560.12		
PUBLICATIONS:													
Paper Submission and Review				\$1500 +							\$1500	setup -	
11 Process		100		3200	\$17/paper	74	2758	\$2,758	See #B	61	17	\$2,537.00	See #R
12 Program Printing				\$100				\$100			\$0.00		
13 Preparation of Master CD				\$200				\$200		110	2.83	\$311.30	See #R
14 CD duplication cost				\$200				\$200	See #C			\$0.00	
15 Proceedings/Abstract Book				\$0				\$0			\$0.00		
16 Shipping Charges				\$0				\$0			\$0.00		
17 Journal Costs				\$0				\$0			\$0.00		
18 Distribution costs				\$0				\$0			\$0.00		
SUB TOTAL				\$3,700				\$3,258				\$2,848.30	
SPECIAL EVENTS		#	FEE	AMOUNT	#	FEE	AMOUNT	#	FEE	AMOUNT			
19 SPOUSE/GUEST HOSPITALITY				\$100			\$100			\$0.00			
20 BREAKFASTS (# provided)		0	\$0	\$0	0	\$0	\$0	0	\$0	\$0.00			
MORNING COFFEE BREAKS (#													
21 provided)		120	\$35	\$4,200	120	\$35	\$4,200			\$379.76			
AFTERNOON BREAKS (#													
22 provided)		120	\$35	\$4,200	120	\$35	\$4,200			\$300			
23 RECEPTION (# provided)		125	\$25	\$3,125	125	\$25	\$3,125			\$2,762.38			
24 LUNCHEONS (# provided)		120	\$80	\$9,600	120	\$80	\$9,600			\$4,950.00			
25 BANQUET (# provided)		125	\$35	\$4,375	125	\$35	\$4,375			\$4,043.11			
26 SPOUSE/GUEST TOURS				\$1,500			\$150	See #D		\$360.00			
27 TECHNICAL TOURS				\$1,000			\$1,000			\$0.00			
28 OTHER EVENTS				\$900			\$900			\$1,512.50	See #T		
SUB TOTAL				\$29,000			\$27,650				\$14,307.75		
CONTRACTED SERVICES:													
AUDIO/VISUAL Contractor: vendor													
29 name				\$0			\$0			\$0.00			
30 Contract #1 : Airport bus				\$8,000			\$4,000	See #E		\$0.00			
31 Contract #2 : Hotel - Conf. Center				\$2,250			\$200	See #F		\$0.00	See #L		
32 Contract #3 : PRVCC insurance				\$0			\$500	See #G		\$171.74			
SUB TOTAL				\$10,250			\$4,700				\$171.74		
OTHER EXPENSES		#	FEE	AMOUNT	#	FEE	AMOUNT	#	FEE	AMOUNT			
33 REGISTRATION PACKET		125	\$15	\$1,875	125	\$15	\$1,875	100	15	\$0.00			
34 AWARDS/CERTIFICATES				\$1,500			\$1,500			\$0.00			
35 REFUNDS				None			None			\$9,615.11	See #S		
CREDIT CARD SERVICES AND													
36 FEES			3.50%	\$4,500		3.50%	\$4,500		3.50%	\$1,967.98	See #R		
37 ADDITIONAL ITEMS				\$400			\$400	2	18	\$36.00	See #Q		
38 CONTINGENCY			20%	\$13,138.75		20%	\$11,105			\$0.00			
SUB TOTAL				\$21,414			\$19,380			\$11,619.09			
TOTAL EXPENSES				\$78,833			\$66,632			\$39,507.00			
SUMMARY OF REVENUE AND EXPENSES													
TOTAL MEETING REVENUE				\$92,125			\$95,000			\$93,045.00			
TOTAL MEETING EXPENSES				\$78,833			\$66,632			\$39,507.00			
TOTAL EXCESS				\$13,293	14%		\$28,368	30%		\$53,538.00	58%		
MEETING HOST/ORGANIZER													
(Local Section or ANS)			25%	\$3,323.13		25%	\$7,092		25%	\$13,384.50			
DIVISION			25%	\$3,323		25%	\$7,092		25%	\$13,384.50			
ANS			50%	\$6,646.25		50%	\$14,184		50%	\$26,769.00			
Total			100%	\$13,293		100%	\$28,368		100%	\$53,538.00			

At the time of preliminary budget review and approval by NPC and ANS Meetings Department, a list of the expenses that are the responsibility of the meeting organizers (meeting host or division) will be identified. These costs (or portions thereof) will be deducted from the meeting organizer's portion of the excess revenue. The organizers are encouraged to discuss these items with the ANS Director of Meetings and the NPC Chair before presenting their preliminary budget for approval.															
EXPENSES THAT WILL BE DEDUCTED FROM PORTIONS OF THE EXCESS REVENUES:															
Item #	Description of Overage											Deduction	Responsibility		
	N/A														
NOTES:															
#A	Was \$2,300 - June and July issues at 75% off, 1/2 page + \$350 design by ANS														
#B	Was \$3,200 based on expected 100 submissions - \$1500 +\$17/paper														
#C	Was \$1,300 - Will be taken care by NMSU/CEMRC														
#D	Was \$1,500 - volunteers set up a guest program at minimum cost for every day of the week														
#E	Was \$8,000 - Most of the participants will rent a car - others will be picked up at nearby airports (Hobbs, Roswell)														
#F	Was \$2,250 - City of Carlsbad will provide shuttle - \$4/day/person														
#G	Was \$0 - Liability insurance for the Conference Center														
#H	Was \$3,000 - Website hosted by ANS Carlsbad section														
#L	The City of Carlsbad Public Transit will offer this service (if needed) for free														
#Q	Credit card fee reimbursed to Fabian Sommer and Maik Stuke														
#R	ANS Invoice - final - dated 10/18/2017														
#S	Expenses reimbursement for 3 Keynote Speakers (Robert Wilson, Calvin Hopper, Tom mcLaughlin) and 2 students (Jesse Norris, Anthony Nelson), required by LANL grant														
#T	Cash bar and Entertainment for Banquet and Reception														
#U	Includes PRVCC and Living Desert Zoo (Banquet)														
#V	Acknowledgement of local committee members + ANS registration package sent back at the end of the meeting														

#### Recommendations:

- Typically, the local section needs to have enough cash in the bank (~ \$5k) to pay initial expenses before the excess revenue check comes, a couple of months after the end of the meeting.
- Work closely with caterers and other providers to find the best prices.
- Pick the right services that ANS can provide to the meeting. We found that the paper review system and registration were great ANS services to use.
- Avoid wasting money on extra stuff that do not bring any values (anymore): expensive advertisements, meeting flyers, signs and posters, program printing, registration packets (unless provided by sponsors).

## Site Logistics

The Pecos River Village Conference Center (PRVCC) was the location of the conference (see picture next page). For a modest fee, we rented the entire facility, which comprises one large conference room (capacity: 450 people), three medium-size rooms (capacity: 100 people), a small room (capacity: 10 people), a large colonnade (for exhibits), a small kitchen and outside grounds next to the Pecos River. The facility rental rates included basic set-up and breakdown of tables, chairs, and selected amenities: table covers, floor podium, projector and screen, sound system, and wireless internet. Laptops and additional projectors, as well as extension power cords, were kindly provided by supportive local organizations (CEMRC, LANL).



At the PRVCC, we hosted the opening reception, the workshops, the opening sessions, and the technical sessions. The facility was adequate for all these activities, and for a crowd of 100+ people. The support from the facility managers was satisfactory. Furthermore, the local organization continuously had a minimum of three staff (including the General Chair) onsite during the conference. We took care of the coffee breaks, and of any questions or issues attendees and sponsors had. We also supervised the front desk, which was staffed with students from the Carlsbad High School (CHS) Business Professionals of America (BPA) program. Additionally, we did some cleaning every day before the conference hours, to ensure the place was ready.

Two particular issues came up during the meeting, concerning the provided microphone and the wireless internet. The microphone was too directional, and was connected to the podium, so the speakers did not have the chance to handle the microphone and move from the podium. This setting was not ideal for a few speakers, who wanted to have the possibility to move around a little bit, and who were not loud enough to be heard without microphone by the entire audience. Also, the facility bandwidth was poor, due to a lack of planning by the facility owner. Consequently, wireless internet, a service included in the rental of the facility, was not really operational for the entire time of the conference. For some of the participants (particularly US nationals), this was not a problem: it was actually a good way for people to focus on the talks. Some others (particularly foreign nationals) were noticeably upset at that issue, but they said they could use free internet at their hotel. Additionally, we had a couple of issues with the projector, but they were quickly fixed by the local organization staff present during the meeting (spare projectors and laptops were available at any moments during the conference). To the appreciation of some users, we also set up a few stations in the conference room for attendees to charge their electronic devices while listening to the talks.

The banquet was held at the Visitor Center of the Carlsbad Living Desert Zoo and Gardens State park. Setting was done at no cost, since local organization staff and volunteers helped with set-up and breakdown of the tables and chairs.

#### *Recommendations:*

- Make sure to test the perks provided with facility (e.g., sound system, wireless internet) before the conference.
- Appreciated addition: provide a few stations with electrical power (extension cords) in the meeting room, so participants can charge their electronic devices while listening to the talks. A few tables were placed close to electrical outlets, to avoid tripping hazards.

- Have staff ready to help and address issues, so that the participants can focus on the professional and technical aspect of the conference.
- Seek for (free) help from the local community! In our case, we received the help of high-school students, who were delighted with the opportunity to meet scientists!

## Food

Because PRVCC is not near to any restaurants, we catered lunch every day of the meeting. Besides the convenience (no trip to make), it was a good way to keep all the participants at the conference center during the lunch break, so they could develop more professional interactions, catch up on things, and enjoy a relaxing environment along the banks of the Pecos River!

Bids for catering went out early (6 months prior to the event). Our goal was to get the best food experience and service in town at the best price. As we were approaching to the meeting time, and the number of registrants was below expectations, we had to adjust our order to a lower number of meals and a lower cost, without compromising the quality service. Similarly to the ANS National meetings, the idea of lunch boxes became evident. At the end, we relied upon two caterers: one for lunches, and one for the opening reception and the banquet. Meals were delivered and served onsite by the caterers. They included non-alcoholic drinks, cutlery, and dessert. Because the caterer selected for lunches owns different local restaurants, we could request different menus every day (American, New-Mexican, Italian, BBQ) for the same cost. The same caterer made an effort to accommodate our needs for the tours on Friday: (cold) lunch boxes were then delivered at 7am, to be distributed around 1pm by the organizers to the attendees at the different locations of the technical tours.

For the opening reception and the banquet, we had music entertainment, and a cash bar. The PRVCC required a \$1,000,000 Liability Insurance for serving alcohol. This was an unexpected expenses, which could have cost over \$750 from local insurance companies. Fortunately, we found online a general insurance contract for much less (\$171.74) that PRVCC was satisfied with!

In our quest of reducing expenses as much as possible, the local organization committee decided a few weeks prior to the event to take care of the coffee breaks, instead of having a caterer doing it. For each coffee break, a local staff was then assigned to brew good quality coffee and tea, and set up the coffee breaks with sodas, water bottles, pastries/cookies and fresh fruits. Despite the huge amount of volunteering work that this required, we saved a substantial amount of money on the coffee breaks!

We received good feedback from attendees regarding the food services we provided. Many appreciated the lunch boxes, and the coffee breaks options. Serving fresh fruits at the coffee break was also very welcome, since it is not very common for a conference.

### *Recommendations:*

- Food is an important feature of a meeting: try to provide lunches and coffee breaks at the best quality possible and for a reasonable cost.
- Be considerate to your customers: brewing good quality coffee and tea, and providing fresh food is not expensive (but it is time consuming!), but it will bring a great appreciation from the attendees!
- Work on menu options with the caterers to find the best items for the best price!

# Publication

It is the responsibility of the Technical Program Chair to establish a Technical Committee for all the technical aspects of the conference: technical sessions, call for papers, paper template, paper review, etc. The local organizing committee is responsible for the official program, and the publication of the Transactions.

The local organizing committee put the official program together, which was extremely time consuming, instead of getting help from ANS. The advantage of this decision was two-fold: money saving, and a better “control” of the document, since many minor changes in the official program (e.g., last minute cancellations, substitutions, etc.) occurred in the last days before the meeting.

The local organizing committee opted for an electronic publication of the Transactions. Way in advance, we purchased ANS jump drives at a very reasonable fee, and with the ANS logo already on them. Conception and application of the meeting label onto the jump drives were easy tasks. A few days before the conference, we prepared all the files of the Transactions according to the ANS guidelines for publication, and uploaded them to the jump drives. The jump drives were distributed to the attendees when they checked in at the front desk on their first day of the meeting.

Even though files were already available on the jump drive, paper copies of the official program and the list of attendees were also available at the front desk during the conference. Those copies were simply printed by us using a Xerox machine owned by a supporting organization (LANL). We did not send this work to a printing business, so we could save some money. Going paper-less is cheaper!

## *Recommendations:*

- Use the ANS EPRS system for paper submission and reviews: it is very efficient, and worth the cost.
- Publication of the Transactions is an area where a lot of money can be saved using dedicated volunteers!
- Go electronic, instead of paper! Jump drives are affordable, and the preparation of the files for the Transactions, even though a lengthy process, is straight forward, using ANS guidelines.

# Overall Organization

In a small local section like the Carlsbad section, the General Chair of the meeting plays a key role in the successful organization of the conference.

Once the Topical meeting was awarded to the local section, about 2 years prior to the event, the General Chair established the local organizing committee. Eleven volunteers, all members of the local ANS section, agreed to serve as chairs or co-chairs in the following sub-committees:

- Accommodations – Mindy Toothman (LANL)
- Finance - Jeremy Creen (NWP)
- Food – Robert Watson (NWP)
- Publications – Bill Weston (RES) and Russell Hardy (NMSU)
- Registration – Christopher Chancellor (LANL)
- Sponsorship – Jef Lucchini (LANL)
- Student – Anderson Ward (DOE)
- Tours – Jonathan Icenhower (SNL)

- Transport – Norbert Rempe (retiree)
- Website – Hugo Castillo (NMSU)
- Workshops – Yongliang Xiong (SNL) *(with the kind participation of Sedat Goluoglu, Technical Program Chair)*

An effort was made to select motivated and committed individuals from all the different local organizations (DOE, LANL, SNL, NWP, RES, NMSU) involved in the local section, in order to have a full support from these entities. Most of these local organizations helped the meeting organizing committee, particularly through their employees involved in the committee. Predominantly LANL and NMSU/CEMRC generously granted extra resources (materials, volunteers, etc.).

From October 2016 to September 2017, the local organization committee members met every month, at CEMRC, to set objectives, move actions forward, and discuss achievements, while enjoying a home cooked dinner! As we got closer and closer to the event, the number of actions evidently cranked up significantly. The organizing committee got very busy the last two weeks before the event, and during the event, since we had decided to take some tasks on our own (e.g., coffee breaks, transportation).

The Carlsbad community was very enthusiast about the meeting, which brought more than 90 people to town for a week. The City of Carlsbad embraced the event, and helped in several areas. They provided the welcome touristic package to the participants, free shuttle transportation from the hotels to the conference center every day, and music entertainment and boat rides at the opening reception. Carlsbad Mayor Dale Janway gave a welcome address at the opening reception and the plenary session. The Department of Energy, Carlsbad Field Office (DOE-CBFO) and the Waste Isolation Pilot Plant (WIPP) operator, Nuclear Waste Partnership LLC (NWP), had a Roadshow Exhibition on Monday and Tuesday featuring the TRUPACT-II and/or HalfPACT packaging that are used in the transportation of nuclear waste across the nation. A successful partnership with the Carlsbad High School (CHS) Business Professionals of America (BPA) program allowed 30 students to help with the conference at the front desk, and gave them the exposure to a professional and scientific world. All of these contributions were free, and were excellent additions to the meeting!

#### *Recommendations:*

- Have a motivated and active group of individuals on the organizing committee (minimum 10), who are employees of key organizations in the community.
- Organize meetings with the local organizing committee members on a regular basis (monthly, or bi-weekly in the last weeks prior to the event), to check on progress and keep the momentum going!
- Solicit (free) help from local partners (City, restaurants, etc.), by showing them the benefits of having ~100 visitors coming to town for a week.

## Communication – Advertisement - Publicity

A good communication between the ANS Division sponsoring the Topical meeting and the local section is key to the success of the meeting.

From the moment the local section was awarded the organization of the meeting, the General Chair, Dr. Jean-Francois (Jef) Lucchini (ANS Carlsbad), and the Technical Program Chair, Pr. Sedat Goluoglu (NCSD), were in contact, particularly when questions, concerns or issues raised. This was very useful to the local section, relatively novice in the role of organizing a Topical (the last Topical meeting organized by the Carlsbad section was in 2006). Among the numerous positive interactions between the two key individuals, only one glitch happened, and it was during the conference, in

which the Technical Program Chair did not attend to, due to unforeseen weather. Neither the General Chair nor the Session Chair knew if there was anything special planned for the Student Competition session!

NCSD invited the General Chair to give an update on the Topical at each of their Executive Meetings (ANS Annual and Winter meeting), as well as their periodical on-call meetings (~2 months). NCSD officers, and particularly the two NCSD Chairs, John Miller (2016) and Deb Hill (2017), were very helpful and responsive to the General Chair requests, concerning historical data from previous NCSD Topicals, list of potential sponsors, suggestions for keynote speakers, postings on the NCSD website, etc. The interactions between NCSD and the ANS Carlsbad were particularly welcome, since the Carlsbad area does not have any representatives from the nuclear criticality safety arena.

It goes without saying that interactions with ANS are necessary and mandatory. The General Chair needs to get the three necessary approvals (Calendar Placement, Preliminary, and Final Approval) from the ANS National Program Committee during the process. The ANS Topical meeting manual contains all the details for the organization of a Topical. About 10 months before the event, the local section obtained from ANS meeting department (Paula Cappelletti) to sign contracts with three selected hotels. Many other examples of interactions between the local section and ANS could be cited, particularly in publication, website, and finance.

Advertisement of the meeting and solicitation for papers were almost exclusively done using emails, and pointing out to the meeting website. Intensive advertisement to potential participants and sponsors started with the production of the call for papers, in December 2016. Additionally, two ads were run in the ANS News, the monthly magazine of the ANS, in June and July 2017 for 25% of the normal cost. Unfortunately, the ads in the ANS News came after submission of papers was closed, so they did not have any impact on the number of submissions, and also on the number of sponsors and exhibitors.

#### *Recommendations:*

- Develop and maintain frequent communication with the Division and ANS, since they are great resources.
- Emails are probably the best and cheap way to advertise the meeting, solicit papers and look for sponsors.
- Advertisement in the ANS News could be a good venue, if done early in the process (when the call for papers is out). However, despite the 75% discount, it is expensive, and the return is not guaranteed.

## Registration

A good registration rate made the finances of this Topical meeting look good! This shows how important registration is, particularly for a meeting without many sponsors...

A draft of the registration form was designed by the local organizing committee as early as the call for papers went out (December 2016). It received a few iterations over time, as things (tutorials, special events, and tours) were shaping up. The final registration form was issued by ANS good communication between the ANS Division sponsoring the Topical meeting and the local section is key to the success of the meeting. The registration form in its final form (see next page) was issued by ANS in March 2017, when registration opened.

Since the local organization committee did not have the resource to handle registration of attendees and foreign currencies, we delegated this service to ANS. This was the best move we made! The ANS online registration is excellent, and easy for any participants. We received periodically a very detailed list of the attendees who registered. A few days before the meeting, we received the badges and ribbons for the attendees. Additionally, we also used the ANS online registration system during the conference, for walk-in participants. Support from ANS staff was excellent all along.





**2017 NCSD Topical Meeting**  
**September 10-15, 2017 \* Carlsbad, NM \* Pecos River Village Conference Center**

**CONTACT INFORMATION**

ANS ID \_\_\_\_\_

Prefix \_\_\_\_\_ First Name \_\_\_\_\_ Middle \_\_\_\_\_ Last Name \_\_\_\_\_ Designation (Ph.D., PE, etc) \_\_\_\_\_

First Name to Appear on Badge \_\_\_\_\_

Job Title \_\_\_\_\_ Company Affiliation \_\_\_\_\_

Street Address \_\_\_\_\_

City / State \_\_\_\_\_ Zip Code/Postal Code \_\_\_\_\_ Country \_\_\_\_\_

Telephone \_\_\_\_\_

Email (required) \_\_\_\_\_ Email (cc) \_\_\_\_\_

Please check all that apply: ☐ I will need a VISA/Invitation Letter to attend this conference. ☐ ADA ☐ Check here to be removed from distribution listing. ☐ Food Allergies \_\_\_\_\_

**MEETING REGISTRATION**

*Member pricing includes ANS national members only. Young Member and Emeritus pricing for qualifying ANS individual national members only. Member rate do not apply to Local Section or Organization members.*

**FULL MEETING REGISTRATION**

Includes Sunday Opening Reception, Luncheons and Breaks on Monday through Friday, Banquet, and Technical Tour/Excursion. Admittance to all Technical Sessions and 2017 NCSD Proceedings on USB.

	Early Bird Paid by August 15, 2017	Fee Paid After August 15, 2017
ANS Member	\$ 750	\$ 850
ANS Emeritus Member	\$ 200	\$ 300
ANS Young Member	\$ 600	\$ 700
Non-Member	\$ 900	\$1,000
Student	\$ 200	\$ 300

Sponsors and Exhibitors Complimentary full meeting registrations included according to Prospectus outline. Please select appropriate full fee. Once sponsor or booth invoice is paid, a Discount Code will be provided to eliminate the registration fee at checkout.

**ONE DAY REGISTRATION**

*Please select Day*

☐ Monday ☐ Wednesday ☐ Friday  
☐ Tuesday ☐ Thursday Includes full conference attendee registration benefits for that day only.

One Day Member Fee	\$ 450	\$ 510
One Day Non-Member Fee	\$ 550	\$ 610

**ADDITIONAL TICKETS**

Please read inclusions in your registration fee. Tickets purchased that are included in registration fee will not be refunded after the published cancellation dates.

Sunday, September 10, 2017: Opening Reception ..... # of tickets \_\_\_\_\_ @ \$25 each = \$ \_\_\_\_\_  
 Wednesday, September 13, 2017: Banquet ..... # of tickets \_\_\_\_\_ @ \$50 each = \$ \_\_\_\_\_  
 Friday, September 15, 2017: Carlsbad Cavern Excursion ..... # of tickets \_\_\_\_\_ @ \$25 each = \$ \_\_\_\_\_

Friday, September 15, 2017: Technical Tour for Attendees Only (no guests). Space is limited, wait list available, no guarantee offered for tours.

Please select **ONE ONLY** ..... ☐ WIPP Tour ☐ URENCO & WCS Tour ☐ Carlsbad Caverns ☐ None

**TUTORIALS**

All Tutorials will take place on Sunday, September 10, 2017. You must be registered for the meeting to attend a tutorial. No refunds available for cancellations.

Automated As-loaded and Design-basis Criticality Analysis for Dry Spent Nuclear Fuel Systems Using UNF-ST&DARDS

1:00 PM-5:00 PM, break included ..... Check to attend \_\_\_\_\_ \$15 \$ \_\_\_\_\_

Monte Carlo Criticality Calculations with MCNP6-Whisper

9:00 AM-5:00 PM, break and lunch included ..... Check to attend \_\_\_\_\_ \$40 \$ \_\_\_\_\_

Performing Criticality Evaluations in Geologic Repositories

1:00 PM-5:00 PM, break included ..... Check to attend \_\_\_\_\_ \$15 \$ \_\_\_\_\_

SCALE 6.2 Criticality Safety Calculations and Sensitivity/Uncertainty Methods for Criticality Safety Validation

8:00 AM-5:00 PM, break and lunch included ..... Check to attend \_\_\_\_\_ \$40 \$ \_\_\_\_\_

**GRAND TOTAL AND FORM OF PAYMENT**

Grand Total = \$ \_\_\_\_\_

Method of Payment ☐ Check ☐ American Express ☐ VISA ☐ MasterCard ☐ Diners Club ☐ Discover ☐ Wire Transfer

Credit Card Number: \_\_\_\_\_ Expiration Date: \_\_\_\_\_ Security Code: \_\_\_\_\_

Cardholder's Signature: \_\_\_\_\_ *Print Cardholder's Name if Different from Registrant*

**PLEASE REGISTER ONSITE AFTER SEPTEMBER 1, 2017**

Make checks payable to ANS in U.S. Funds and Mail to ANS, 97781 Eagle Way, Chicago IL 60678-9770. When sending something to ANS with Express Mail or an overnight service provider, do not use the Eagle Way address. It will be returned. Contact the ANS Registrar for overnight shipping information. Credit card registrations may be faxed to 708.579.8234. Send bank funds transfer to Chase Bank, 10 S. Dearborn St., Chicago IL 60603. ANS Checking Acct #824941, Bank Routing Number (ABA) 0210 0002 1 \* SWIFTCODE CHASUS33 \* ACH Transfers 0710 0001 3

Registration cancellations must be made in writing prior to August 15, 2017, in order to receive a refund minus \$150 processing fee.

No refunds after August 15, 2017; however you may send a substitute. Please contact ANS Registration at telephone number 708.579.8316 or email [registrar@ans.org](mailto:registrar@ans.org) with any questions.



### *Recommendations:*

- Use ANS for registration! The ANS online registration system is excellent, and worth the cost. This way, no cash to handle, no hassles with cancellations or foreign currencies.
- ANS provides badges and ribbons for the participants. It is included in the ANS registration package.

## Tours

The existence of the ANS Carlsbad section is based on the presence of the Waste Isolation Pilot Plant (WIPP), the only U.S. deep geological repository licensed to permanently dispose of the nation's defense-related transuranic waste. Consequently, the WIPP was an obvious destination for a technical tour. Two other exceptional nuclear facilities located at the New Mexico-Texas border, were also accessible from Carlsbad and available for a technical tour: the URENCO Enrichment Facility, and the Waste Control Specialists (WCS) Facility. The Technical Tours were offered to the registered meeting attendees only (no Spouses or Guests). Participants had to sign up at the time of registration. Participation was free of charges. Space was limited, and selection was made on a "first come, first served" basis. Because specific authorization had to be completed ahead of time, and additional paperwork were requested from participants on a case by case basis, the deadline to sign up for the technical tours was July 17 (about 2 months prior to the event). In reality, despite all our efforts to accommodate the requirements of all the different sites, we had some last minute issues (foreign nationals' access, schedule). The lists of participants to those tours were finalized ... during the conference, the day before! Our local partners (NWP, LANL) provided van transportation to the participants.

We could not omit a non-technical tour to the remarkable Carlsbad Caverns National Park, the touristic jewel of Southeast New Mexico. This excursion was open to spouses and guests, and was also free of charge for participants who sign up at the time of registration. In addition to the general entrance, we offered a ranger-guided tour to the beautiful King's Palace, the deepest portion of the cavern open to the public. Transportation to the Carlsbad Caverns National Park was not provided, so visitors could enjoy the Caverns all day long, and attend the spectacular Bat Flight program, which took place at dusk. Mid-September was the perfect time to see thousands of bats exiting the cave to look for food. The excursion to the Carlsbad Caverns was our general plan B, in the case of unexpected last-minute events (leading to cancellations) would have happened at any of the technical tours.

Overall, the tours went well, and were a success: 20 participants to the Carlsbad Caverns excursion and the WIPP tour, 10 to the WCS tour, and 5 to the URENCO plant (low number due to foreign nationals' last minute restriction). For example, a few people wished to go to the WIPP tour, but we already exceeded the maximum attendance capacity. We provided cold lunch box to all the participants at the location of the tours, since there were no convenient restaurants on sites.

### *Recommendations:*

- Choose technical tours wisely, as they are a great asset to the conference.
- Set them up early in the process, keep your onsite points of contact updated on the signups, and provide them all the required documentation/information they need (for site access for example).
- Make sure you have a plan B in the case of unexpected constraints or cancellations of a tour!



## Transportation

The remoteness of Carlsbad was the main obstacle of the Carlsbad section' application to host the 2017 NCSD Topical. Many NCSD members stated their concern about the absence of a close-by major airport. The closest international airport is the El Paso airport, 160 miles southwest of Carlsbad.

This is the reason why, in their first budget exercise, the local organization committee allocated \$8k for transportation between nearby airports and the city of Carlsbad. However, we encouraged participants to make advance reservations for renting a car at their arrival airports for the final leg of their journey to Carlsbad. For those unable to arrange their own ground transportation, we recommended them to select a local or regional airport (Carlsbad (CNM), Hobbs – 75 miles east of Carlsbad, or Roswell – 80 miles north of Carlsbad) for their arrival and contact the General Chair at the time of their online registration to make ground transportation arrangements with the Conference organizers. The majority

of the participants rented a car, sometimes in groups. Only 5 participants needed a ride from and to the airport, and these rides were kindly provided by local volunteers.

For local transportation between hotels and the conference venue, participants used their rental vehicles and shared rides with other colleagues. Additionally, the City of Carlsbad kindly chartered a dedicated shuttle that ran twice a day between hotels and the PRVCC, as well as to the Carlsbad Living Desert Zoo for the banquet on Wednesday.

For transportation between Carlsbad and technical tour sites (with the exception of the Carlsbad Caverns), registered participants were transported by vans provided by the conference organizers.

For the closeout budget, the local organization committee was very satisfied to have spent... no money on this important aspect of the conference! This was certainly the biggest saving line in the budget.

#### *Recommendations:*

- Transportation is usually not a concern for meetings. However, for remote venues like Carlsbad, it can be a huge obstacle. Therefore, it is important to assure the potential attendees that transportation will be provided from their arrival airports to the place of the conference.
- If transportation needs to be arranged, it is better to allocate a substantial amount of money in the first budget evaluations, in order to avoid bad surprises later on.

## Website

The conference website was the only reliable way to communicate information and updates to potential attendees and the public. It was also the best way to acknowledge our sponsors.

The ANS Carlsbad section already had a website, operated by a local company for a modest annual fee. The ANS Carlsbad section website was redesigned in order to host the conference website. Many pages were created to accommodate the different topics: important dates / schedule, fees / registration, call for papers, paper submission / review, tutorials, technical tours / excursions, travel (including hotels, transportation, things to do), sponsors, students / post-docs, program / keynote speakers, organizing committee. A Home page included information about ANS, the ANS code of ethics, the ANS statement of diversity, and the ANS respectful behavior policy. After the conference, a gallery page was generated to display the pictures taken during the event.

For a cost of \$343.50 (compared to \$3k for a website entirely managed by ANS), the website of the conference was successfully operated, and all updates were posted in a timely fashion.

Additionally, key information and documentation were posted on the Topicals and Executive Conferences webpage of the ANS website. Key documentation included the following: call for papers, paper template, copyright form, exhibit and sponsor prospectus, registration form, and official program.

#### *Recommendations:*

- The conference website is certainly the first thing to create, and the last thing to take down! It is the main vehicle of information to the public, so postings need to be done on a timely fashion.
- Many website providers are available, efficient, and relatively inexpensive. Make the right choice.

# Tutorials / Workshops

Tutorials were a nice asset to the conference. Four Tutorials were initially proposed to the attendees who registered for the conference. Participants to the Tutorial of their choice had to sign up at the time of registration, and pay the corresponding participation fee (\$15 for a half-day workshop, \$40 for a full day workshop). These fees were established to mainly support the cost of the coffee breaks and lunch that day, since these expenses were missed in the first budget evaluation.

The four Tutorials were the following:

- A. Automated As-loaded and Design-basis Criticality Analysis for Dry Spent Nuclear Fuel Systems Using UNF-ST&DARDS

Organizer: Kaushik Banerjee (ORNL)

- B. Monte Carlo Criticality Calculations with MCNP6-Whisper

Organizers: Forrest Brown, Jennifer Alwin, Michael Rising (LANL)

- C. Performing Criticality Evaluations in Geologic Repositories

Organizer: John Scaglione (ORNL)

- D. SCALE 6.2 Criticality Safety Calculations and Sensitivity/Uncertainty Methods for Criticality Safety Validation

Organizer: Chris Perfetti, Justin Clarity (ORNL)

Late July, John Scaglione announced that he was not approved to give Tutorial C, so it got removed, and the couple of participants who signed up for this Tutorial agreed to take Tutorial A instead.

A total of 29 participants were there on Sunday, to learn about the different programs taught in the offered Tutorials. The organizers did a great job to teach those workshops with a real passion, and using a minimum of local resources (only projectors and power cords were requested).

## *Recommendations:*

- Tutorials should not be neglected, because they can draw interest among potential participants. If the facility permits, try to offer as many tutorials as possible.
- Make sure you provide the organizers of tutorials all the support they need to teach their workshop. Keep them updated on the number of signups, as you get close to the event.

# Official Program





# ANS NCSD



## 2017 NUCLEAR CRITICALITY SAFETY DIVISION TOPICAL MEETING

September 10-15, 2017

Pecos River Village Conference Center,  
Carlsbad, NM

*Criticality Safety – pushing boundaries by modernizing and integrating data, methods, and regulations*

# OFFICIAL PROGRAM

PROUD SPONSORS:



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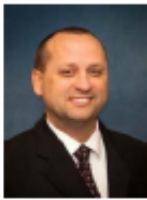
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# Meeting Officials

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Criticality Safety – pushing boundaries by modernizing and integrating data, methods, and regulations

2017 Nuclear Criticality Safety Division Topical Meeting



HONORARY CHAIR  
Mr. Todd Shrader  
*Department of Energy*



HONORARY CHAIR  
Mr. Jeff Carswell  
*Department of Energy*



GENERAL CHAIR  
Dr. Jef Lucchini  
*Los Alamos National Laboratory*



TECHNICAL PROGRAM CHAIR  
Pr. Sedat Goluoglu  
*University of Florida*



TECHNICAL PROGRAM CO-CHAIR  
Dr. Kevin H. Reynolds  
*Department of Energy*



TECHNICAL COMMITTEE  
Dr. John D. Bess  
*Idaho National Laboratory*



TECHNICAL COMMITTEE  
Dr. Kaushik Banerjee  
*Oak Ridge National Laboratory*



TECHNICAL COMMITTEE  
Dr. Larry Berg  
*Department of Energy*



TECHNICAL COMMITTEE  
Dr. Doug Bowen  
*Oak Ridge National Laboratory*

# Keynote Speakers

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## Criticality Safety – pushing boundaries by modernizing and integrating data, methods, and regulations

### 2017 Nuclear Criticality Safety Division Topical Meeting



Dr. Robert Wilson  
*Department of Energy*

**Robert Wilson** obtained a Bachelor and Masters of Science degree in Engineering Physics from the University of California at Los Angeles and a PhD in Nuclear Engineering from the University of Washington.

His dissertation was in experimental critical mass physics and post-doctoral work was in fast reactor safety analysis. Following academia he assumed responsibility for the Criticality Safety Program at the Idaho Chemical Processing Plant (ICPP). While at ICPP he managed the safety response to a criticality accident in 1978 and managed the rebuilding of the criticality safety program. Following ICPP, he worked as the senior criticality safety specialist for the U.S. Nuclear Regulatory Commission and later assumed responsibility for the criticality safety program at the Rocky Flats Site.

He has served as a member of the Argonne National Laboratory Nuclear Facility Safety Committee, the Los Alamos National Laboratory Nuclear Criticality Safety Committee (current), the DOE Nuclear Criticality Technology and Safety Panel and the DOE Criticality Safety Support Group. He has been the General Chairman and Program Chairman for ANS topical meetings in criticality safety. He has twice served as chair of the ANS Nuclear Criticality Safety Division. He has served as an Affiliate Professor of Nuclear Engineering for the University of Idaho and has lectured at dozens of University of New Mexico Short Courses on Nuclear Criticality Safety.

He is a member of several ANSI writing groups for criticality safety related standards and is a member of the Nuclear Criticality Safety Consensus Committee for the American National Standards Institute.



Mr. Calvin M. Hopper  
*Oak Ridge National Laboratory retiree*

**Mr. Calvin M. Hopper** retired from the Oak Ridge National Laboratory (ORNL) in 2008 as a Distinguished Development and Design Engineer in the Radiation Transport and Criticality Group within the Nuclear Science and Technology Division.

Over the past 47 years, following his receipt of a B.S. in Physics from Southern Colorado State College, Hopper has held various technical, administrative and consulting positions within the Oak Ridge, Tennessee contractor facilities. In his continuing consultancies he has performed part-time on-going work for ORNL contracts to the US Department of Energy (DOE) and US Nuclear Regulatory Commission (NRC) [2008 – 2017], three years of consulting to the Oak Ridge Y-12 National Security Complex [2008 – 2011], and two years of support to the US Defense Nuclear Facility Safety Board as well as incidental support to the US DOE Nuclear Criticality Safety Program, and the Canadian Chalk River Repatriation of HEU to the US.

Throughout his career Hopper has provided both training and NCS analyses/evaluations consulting services to industries in the US and Canada. Additionally, he has provided educational services through the University of Tennessee – Nuclear Engineering Department graduate classes and Tennessee Industries Week programs and lectured for the US DOE Prevention of Significant Nuclear Events and Potential Safety Impacts of New Technologies on the Operation of DOE Nuclear Facilities. He is currently providing sporadic services to ORNL in the areas of NCS. Independently he has provided NCS program assessments and mentoring support to the US Defense Nuclear Facility Safety Board.





Dr. Thomas P. McLaughlin  
*Los Alamos National Laboratory retiree*

**Dr. McLaughlin** has been active in performing, analyzing and designing critical experiments, performing theoretical reactor safety analyses and conducting all aspects of criticality safety for 50 years. The last 40 have been focused almost exclusively in criticality safety, with 30-plus years at Los Alamos National Laboratory. Since his retirement from Los Alamos in 2004 he has consulted for the DOE and the NRC and many of their contractors and licensees. He has also consulted for Canadian and Australian research laboratories.

He has been active in providing training in criticality safety throughout his career. His work at Los Alamos included criticality safety responsibility for all US nuclear weapons of Los Alamos design and providing written guidance in manuals and training in-person training to members of the three military branches. He is a charter member of the DOE's Criticality Safety Support Group. He has been active in ANS-8 Standards for over 30 years and was chair of ANS-8 for 20 of those.

A highlight of his career was reaching out to, and successfully interacting with, his Russian counterparts at various sites in Russia shortly after the fall of the Soviet Union in 1991. Throughout the 90's he and co-workers at Los Alamos gathered, from personal interviews, undocumented accounts of both their process criticality accidents as well as their critical experiment accidents and published them in the report "A Review of Criticality Accidents" - 2000 Revision. After the Japanese criticality accident at Tokai-Mura in 1999 he was selected as the criticality safety expert on the US government's 3-person team providing immediate technical assistance to the Japanese government.

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Dear Colleagues,

The ANS Carlsbad Section and the local community welcome you to the 2017 NCSD Topical meeting! It will be held at the Pecos River Village Conference Center (PRVCC) in Carlsbad, NM, September 10-15, 2017.

The purpose of the NCSD Topical meetings is to offer an international forum for discussion of all the aspects of the safety of fissile material operations outside of reactors. The 2017 NCSD Topical will provide an opportunity for national and international individuals, professionals and students, technical experts and program managers in the nuclear criticality safety community to meet and discuss their research and work face-to-face. These interactions can help establish good working relationships and collaborations to solve common problems across multiple disciplines. Also, old friendships can be cultivated and new ones established.

The city of Carlsbad, NM, is a great venue for the 2017 NCSD Topical meeting! The area is home to unique nuclear facilities (Waste Isolation Pilot Plant, URENCO Enrichment Facility, and Waste Control Specialists) and is an excellent tourist destination (Carlsbad Caverns National Park, Guadalupe Mountains National Park, UFO Museum).

We are looking forward to seeing you in Carlsbad, NM!

Jef Lucchini  
General Chair of the 2017 NCSD Topical meeting

# Daily Schedule

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## Sunday, September 10

7:30 am – 7:00 pm	Registration
8:00 am – 5:00 pm	Tutorial-D: SCALE 6.2 Criticality Safety Calculations and Sensitivity/Uncertainty Methods for Criticality Safety Validation
9:00 am – 5:00 pm	Tutorial-B: Monte Carlo Criticality Calculations with MCNP6-Whisper
10:00 – 10:20 am	Morning Break
12:00 – 1:00 pm	Lunch
1:00 – 5:00 pm	Tutorial-A: Automated As-loaded and Design-basis Criticality Analysis for Dry Spent Nuclear Fuel Systems Using UNF-ST&DARDS
3:00 – 3:20 pm	Afternoon Break
5:20 – 8:00 pm	Opening Reception

## Monday, September 11

7:30 am – 5:00 pm	Registration
8:20 – 9:45 am	Plenary-I: Nuclear Waste Management in Southeast New Mexico
9:00 – 1:00 pm	Waste Isolation Pilot Plant (WIPP) Roadshow Exhibition - I
10:00 – 10:20 am	Morning Break
10:20 am – 12:20 pm	Plenary-II: Nuclear Criticality & Safety in Our World
12:20 – 1:20 pm	Lunch
1:20 – 3:00 pm	Technical Sessions <ul style="list-style-type: none"><li>• Experiment Needs/Proposals</li><li>• Validation/Applicability Studies I</li></ul>
3:00 – 3:20 pm	Afternoon Break
3:20 – 5:00 pm	Technical Session <ul style="list-style-type: none"><li>• Validation/Applicability Studies II</li></ul>

# Daily Schedule

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## Tuesday, September 12

7:30 am – 5:00 pm	Registration
8:20 – 10:00 am	Technical Session <ul style="list-style-type: none"><li>• Burnup Credit I</li></ul>
9:00 – 1:00 pm	WIPP Roadshow Exhibition - II
10:00 – 10:20 am	Morning Break
10:20 am – 12:00 pm	Technical Sessions <ul style="list-style-type: none"><li>• Burnup Credit II</li><li>• Storage, Transportation, and Disposal of Fissile Materials</li></ul>
12:00 – 1:20 pm	Lunch
1:20 – 3:00 pm	Technical Session <ul style="list-style-type: none"><li>• Criticality Safety – General I</li></ul>
3:00 – 3:20 pm	Afternoon Break
3:20 – 5:00 pm	Technical Session <ul style="list-style-type: none"><li>• Criticality Safety – General II</li></ul>



*Courtesy of the Department of Energy, Carlsbad Field Office (DOE-CBFO)*

# Daily Schedule

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## Wednesday, September 13

7:30 am – 5:00 pm	Registration
8:20 – 10:00 am	Technical Sessions <ul style="list-style-type: none"><li>• Information Access</li><li>• Nuclear Data (Including ENDF/BVIII) and Libraries</li><li>• Spent Nuclear Fuel and Other Fissile Materials Criticality Safety from Applicants and Regulators Perspective</li></ul>
10:00 – 10:20 am	Morning Break
10:20 am – 12:00 pm	Technical Sessions <ul style="list-style-type: none"><li>• Qualification Programs</li><li>• University Initiatives/Course/Distance Educ.</li></ul>
12:00 – 1:20 pm	Lunch
1:20 – 3:00 pm	Technical Session <ul style="list-style-type: none"><li>• Criticality Safety – General III</li></ul>
3:00 – 3:20 pm	Afternoon Break
3:20 – 5:00 pm	Technical Sessions <ul style="list-style-type: none"><li>• Disposal Criticality and Criticality Consequences Analysis in the Disposal Time Frame</li><li>• Fuel Fabrication and Operational Practices</li><li>• Student Competition</li></ul>
6:00 – 9:00 pm	Banquet at the Living Desert Zoo & Gardens State Park Visitor Center



*Courtesy of the Living Desert Zoo & Gardens State Park*



# Daily Schedule

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## Thursday, September 14

7:30 am – 3:00 pm	Registration
8:20 – 10:00 am	Technical Sessions <ul style="list-style-type: none"><li>• Criticality Safety - General IV</li><li>• Accident Analysis and Alarm Systems</li></ul>
10:00 – 10:20 am	Morning Break
10:20 am – 12:00 pm	Technical Session <ul style="list-style-type: none"><li>• Methods and Software Development I</li></ul>
12:00 – 1:20 pm	Lunch
1:20 – 2:20 pm	Technical Session <ul style="list-style-type: none"><li>• Methods and Software Development II</li></ul>

## Friday, September 15

7:30 am – 5:00 pm	Technical Tours <ul style="list-style-type: none"><li>• WIPP</li><li>• URENCO + Waste Control Specialists (WCS) Tour</li></ul>
7:30 am – 5:00 pm	Carlsbad Caverns Excursion
12:00 – 1:00 pm	Lunch



*Courtesy of the National Park Service, Carlsbad Caverns*

# General Information

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## LOCATIONS

Registration, tutorials, opening reception, plenaries, and technical sessions will be held at the Pecos River Village Conference Center (PRVCC), 711 Muscatel Avenue, Carlsbad, NM 88220.

The banquet will be held at the Living Desert Zoo & Gardens State Park Visitor Center, 1504 Miehl Drive N., Carlsbad, NM 88220.

## REGISTRATION

Meeting registration is required for all attendees and speakers. Badges are required for admission to all plenaries, technical sessions and events.

## REGISTRATION HOURS

Sunday, September 10	7:30 am – 7:00 pm
Monday, September 11	7:30 am – 5:00 pm
Tuesday, September 12	7:30 am – 5:00 pm
Wednesday, September 13	7:30 am – 5:00 pm
Thursday, September 14	7:30 am – 3:00 pm

## NOTICE FOR SPEAKERS

All speakers and Session Chairs must check in at the Conference front desk during registration hours.

## ATTENDEE MEAL FUNCTIONS

Morning Breaks will be provided to all registered meeting attendees, Sunday – Thursday.  
Afternoon Breaks will be provided to all registered meeting attendees, Sunday – Wednesday.

Lunch will be provided to all registered meeting attendees, Sunday – Friday.

Opening Reception is included with a full meeting registration. Hors d'oeuvres will be served, and a cash bar will be available.

Banquet is included with a full meeting registration. Dinner will be served, and a cash bar will be available.

# General Information

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## ABOUT ANS

### Mission

ANS provides its members with opportunities for professional development. It also serves the nuclear community by creating a forum for sharing information and advancements in technology, and by engaging the public and policymakers through communication outreach.

### Code of Ethics

Recognizing the profound importance of nuclear science and technology in affecting the quality of life throughout the world, members of the American Nuclear Society (ANS) are committed to the highest ethical and professional conduct.

ANS members as professionals are dedicated to improving the understanding of nuclear science and technology, appropriate applications, and potential consequences of their use.

To that end, ANS members uphold and advance the integrity and honor of their professions by using their knowledge and skill for the enhancement of human welfare and the environment; being honest and impartial; serving with fidelity the public, their employers, and their clients; and striving to continuously improve the competence and prestige of their various professions. The Code of Ethics can be found at [www.ans.org/about/coe](http://www.ans.org/about/coe).

### Statement on Diversity

The American Nuclear Society (ANS) is committed, in principle and in practice, to creating a diverse and welcoming environment for everyone interested in nuclear science and technology. Diversity means creating an environment – both in ANS and in the profession – in which all members are valued equitably for their skills and abilities and respected equally for their unique perspectives and experiences. Diverse backgrounds foster unique contributions and capabilities, and so creation of an inclusive Society ultimately leads to a more creative, effective, and technically respected Society.

ANS believes that everyone deserves opportunities for learning, networking, leadership, training, recognition, volunteering in Society activities, and all the other benefits that involvement in the Society brings, regardless of age, color, creed, disability, ethnicity, gender identity and expression, marital status, military service status, national origin, parental status, physical appearance, race, religion, sex, or sexual orientation. The selection of a member to serve in ANS's volunteer leadership structure shall be based solely on the member's ability, interest and commitment to serve. In particular, ANS encourages members at each level of the Society and in each Professional Division and Technical Group to make special efforts to recruit underrepresented minorities and women to ensure that they are adequately represented in the Society.

### Respectful Behavior Policy (Abbreviated)

The open exchange of ideas, freedom of thought and expression, and productive scientific debate are central to the mission of the American Nuclear Society (ANS). These require an open and diverse environment that is built on dignity and mutual respect for all participants and ANS staff members, and is free of bias and intimidation.

ANS is dedicated to providing a safe, welcoming, and productive experience for everyone participating in Society events and other Society activities regardless of age, color, creed, disability, ethnicity, gender identity and expression, marital status, military service status, national origin, parental status, physical appearance, race, religion, sex, or sexual orientation. Creation of a safe and welcoming environment is a shared responsibility held by all participants. Therefore, ANS will not tolerate harassment of or by participants (including ANS volunteer leaders and staff members) in any form. Disciplinary action for participants found to have violated this principle may include reprimand, expulsion from an event or activity with or without a refund, temporary or permanent exclusion from all ANS events and activities, suspension or expulsion from volunteer leadership positions or groups, and/or suspension or expulsion from Society membership, as appropriate.

**If you or someone else experiences harassment, regardless of how you otherwise choose to initially handle the situation,** you are encouraged to report the situation to ANS. It is possible that the behavior you experienced is part of a larger pattern of repeated harassment. Please alert ANS to behavior you feel to be harassment regardless of the offender's identity or standing in the Society.

The designated contact person for reports at the 2017 NCSD Topical meeting is General Chair Jef Lucchini, who can be reached at 575-706-0213 during the event. In addition, you may contact ANS Executive Director Robert C. Fine during or after the event at 708-476-7096 or [rfine@ans.org](mailto:rfine@ans.org).

The complete Respectful Behavior Policy can be found at [www.ans.org/about/rbp](http://www.ans.org/about/rbp). If you have questions about the policy, please contact ANS Executive Director Robert C. Fine at 708-579-8200 or [rfine@ans.org](mailto:rfine@ans.org).



# Plenary, Special Sessions & Events

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## SUNDAY, SEPTEMBER 10

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### **Tutorial-D: SCALE 6.2 Criticality Safety Calculations and Sensitivity/Uncertainty Methods for Criticality Safety Validation**

**Organizer:** Chris Perfetti (*Oak Ridge National Laboratory*)

**Location:** Pecos River Village Conference Center **Time:** 8:00 am – 5:00 pm

This course will cover the theory and use of tools in the SCALE 6.2 Code Package for criticality safety calculations and sensitivity/uncertainty-informed criticality safety validation. The first half of the course will provide instruction on performing criticality safety calculations using the KENO-VI code, a 3-D generalized geometry Monte Carlo code that allows for versatile modeling of complex geometries using either continuous-energy or multigroup physics. This class will use the Fulcrum user interface for interactive model setup, visualization of inputs and results, execution of SCALE, and output review. Instruction will also be provided on the SCALE material input and resonance self-shielding capabilities, including Fulcrum capabilities for visualizing fluxes, reaction rates, and cross-section data. By the end of the first half of this course, users will understand the basic steps involved in building KENO-VI geometries and will develop KENO models for several simple systems. More experienced users are encouraged to attend and develop more complicated models for their applications of interest.

The second half of this course will focus on SCALE sensitivity and uncertainty methods for criticality safety validation. This block will begin by discussing the TSUNAMI-3D methods for sensitivity analysis, and will discuss sensitivity coefficient calculations for eigenvalue responses using continuous-energy physics models. This course will then discuss SCALE's comprehensive library of cross-section covariance data, which can be used to estimate the uncertainty present in eigenvalues and other system responses when combined with TSUNAMI sensitivity coefficients. An alternate approach for uncertainty quantification will also be presented using the SAMPLER tool, which allows for uncertainty analysis by randomly sampling cross section data, geometry information, and other parameters. This course will conclude by briefly discussing how sensitivity and uncertainty analysis methods enable advanced techniques for code and data validation, including the identification of appropriate benchmark experiments, detailed quantification of bias and bias uncertainty, and identification of gaps in available experiments.

The tutorial is open to all registered meeting attendees who signed up at the time of registration. Participants wishing to follow along with the tutorial should bring their own computer, have a valid license for SCALE 6.2.0 or a more recent version, and have this SCALE version installed on their computer.

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### **Tutorial-B: Monte Carlo Criticality Calculations with MCNP6-Whisper**

**Organizers:** Forrest Brown, Jennifer Alwin, Michael Rising (*Los Alamos National Laboratory*)

**Location:** Pecos River Village Conference Center **Time:** 9:00 am – 5:00 pm

#### *Review of MC criticality fundamentals (9am - 11am)*

This portion of the tutorial session is targeted at new or early-career criticality safety analysts to provide a review of basic concepts, including: best practices for MC criticality calculations, spectra, lethargy, sensitivity, nuclear data uncertainties, etc.

#### *What's new with MCNP6.2 & Whisper-1.1 (11am - 12pm)*

An update on what is the same or different with the Spring 2017 release of MCNP6.2 & Whisper-1.1.

#### *Tutorial on using MCNP6-Whisper-1.1 for NCS validation (1pm - 5pm)*

Whisper-1.1 makes use of MCNP6-generated sensitivity profiles and cross-section covariance data to provide guidance for setting baseline USLs for NCS validation. Background & practical application of the new tool will be covered, along with discussion of ANS standards.

The tutorial is open to all registered meeting attendees who signed up at the time of registration. Discussion time will be available for specific issues concerning installation, problem resolution, user issues, computational details, etc. Laptops are not required, but participants with laptops & installed MCNP6 can follow the demonstrations hands-on.



# Plenary, Special Sessions & Events

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## SUNDAY, SEPTEMBER 10 CONTINUED

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### **Tutorial-A: Automated As-loaded and Design-basis Criticality Analysis for Dry Spent Nuclear Fuel Systems Using UNF-ST&DARDS**

**Organizer:** Kaushik Banerjee (*Oak Ridge National Laboratory*)

**Location:** Pecos River Village Conference Center **Time:** 1:00 – 5:00 pm

The Used Nuclear Fuel-Storage, Transportation & Disposal Analysis Resource and Data System (UNF-ST&DARDS) is being developed at Oak Ridge National Laboratory in collaboration with multiple national laboratories and nuclear industry participants (utilities, fuel vendors, and cask vendors) for integrating spent nuclear fuel (SNF) management through its final disposition. When basic information about the SNF and the cask system is provided, the data relationships defined in UNF-ST&DARDS allow inputs to the respective codes (e.g., SCALE) to be built autonomously. This tutorial will include (1) as-loaded (using actual cask loading maps) criticality analysis of currently loaded casks for storage, transportation, and disposal (over disposal time periods), (2) discussion of as-loaded criticality analysis to support licensing/certification of dry SNF systems, (3) misload analysis methodology to support as-loaded criticality analysis, and (4) design-basis criticality analysis using user-defined loading patterns and fuel assembly types.

The tutorial is open to all registered meeting attendees who signed up at the time of registration. Laptops are not required, but participants with valid licenses for UNF-ST&DARDS 3.1Beta (by invitation only) and SCALE 6.2.2 installed on their computer (windows machine) can follow the demonstrations hands-on.

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### **Opening Reception**

**Location:** Pecos River Village Conference Center **Time:** 5:20 – 8:00 pm

All attendees are invited to enjoy an evening of networking!

Nice boat ride tours on the Pecos River will be kindly offered by the Carlsbad Chamber of Commerce (departure at 5:30 pm and 6:30 pm – duration: about 40 min). Carlsbad Mayor Dale Janway will give a welcome address at 6:15 pm. The unique Carlsbad Mariachi Unido band will be performing some authentic Mariachi music during the evening. Heavy hors d'oeuvres will be served, and a cash bar will be available.

This event is included in your full meeting registration. Additional tickets are available for purchase at the following cost: \$25.



*Courtesy of the City of Carlsbad, NM*

# Plenary, Special Sessions & Events

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## MONDAY, SEPTEMBER 11

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### Plenary-I: Nuclear Waste Management in Southeast New Mexico

**Chair:** Jef Lucchini (*Los Alamos National Laboratory*)

**Location:** Pecos River Village Conference Center **Time:** 8:20 – 9:45 am

Invited speakers will welcome the meeting attendees, and highlight the projects and successes in nuclear waste management in Southeast New Mexico.

**8:20 am:** Welcoming Address, D. Janway (*Carlsbad Mayor*)

**8:30 am:** The Waste Isolation Pilot Plant, J. Carswell (*Department of Energy, Carlsbad Field Office*), Honorary Chair

**9:00 am:** A Centralized Interim Storage Facility for Used Nuclear Fuel, J. Heaton (*Eddy-Lea Energy Alliance, LLC*)

**9:20 am:** Welcoming Address, C. Brown (*New Mexico Representative*)

**9:30 am:** Los Alamos National Laboratory in support of the Waste Isolation Pilot Plant, N.Z. Elkins (*Los Alamos National Laboratory*)

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### Waste Isolation Pilot Plant (WIPP) Roadshow Exhibition - I

**Location:** Pecos River Village Conference Center parking lot **Time:** 9:00 am – 1:00 pm

The Department of Energy, Carlsbad Field Office (DOE-CBFO) and the Waste Isolation Pilot Plant (WIPP) operator, Nuclear Waste Partnership LLC, will have a Roadshow Exhibition featuring the TRUPACT-II and/or HalfPACT packaging that are used in the transportation of nuclear waste across the nation. Specialists will be present to answer questions from the audience.

This free event is included in your meeting registration.



*Courtesy of the Department of Energy, Carlsbad Field Office (DOE-CBFO)*

# Plenary, Special Sessions & Events

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## MONDAY, SEPTEMBER 11 CONTINUED

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### Plenary-II: Nuclear Criticality & Safety in Our World

**Chair:** Jef Lucchini (*Los Alamos National Laboratory*)

**Location:** Pecos River Village Conference Center **Time:** 10:20 am – 12:20 pm

Invited keynote speakers will make presentations on various major topics of nuclear criticality safety.

**10:20 am:** Criticality Safety in Waste Streams, R. Wilson (*Department of Energy, Environmental Management Consolidated Business Center*)

**11:00 am:** Relative Acceptable Societal Risks and Their Relevance to Nuclear Operations, C. Hopper (*Oak Ridge National Laboratory, retiree*)

**11:40 am:** Criticality Accidents – History and Current Impacts, T.P. McLaughlin (*Los Alamos National Laboratory, retiree*)

## TUESDAY, SEPTEMBER 12

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### Waste Isolation Pilot Plant (WIPP) Roadshow Exhibition - II

**Location:** Pecos River Village Conference Center parking lot **Time:** 9:00 am – 1:00 pm

The Department of Energy, Carlsbad Field Office (DOE-CBFO) and the Waste Isolation Pilot Plant (WIPP) operator, Nuclear Waste Partnership LLC, will have a Roadshow Exhibition featuring the TRUPACT-III packaging that is used in the transportation of nuclear waste across the nation. Specialists will be present to answer questions from the audience.

This free event is included in your meeting registration.



*Courtesy of the Department of Energy, Carlsbad Field Office (DOE-CBFO)*



# Plenary, Special Sessions & Events

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## WEDNESDAY, SEPTEMBER 13

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### Banquet

**Location:** Living Desert Zoo & Gardens State Park Visitor Center **Time:** 6:00 – 9:00 pm

All attendees are invited to enjoy an evening of celebration in the relaxing atmosphere of the Carlsbad Living Desert Zoo & Gardens State Park Visitor Center!

Even though the zoo and the park will be closed at that time, you will still be able to get a good idea of the richness and diversity of the native wildlife of the Chihuahuan Desert with the various exhibits displayed in the foyer of the Visitor Center. Additionally, the zoo gift shop & book store will be exceptionally open for a couple of hours for the conference attendees to purchase some characteristic souvenirs of the area, and a 10% discount will be applied to all purchases.

DJ Jose Ornelas will play your favorite music on demand. A cash bar will be available. A typical Southeast New Mexican dinner will be served.

This event is included in your full meeting registration. Additional tickets are available for purchase at the following cost: \$50.



*Courtesy of the Living Desert Zoo & Gardens State Park*

# Plenary, Special Sessions & Events

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## FRIDAY, SEPTEMBER 15

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### Technical Tour-A: Waste Isolation Pilot Plant (WIPP) Tour

**Time:** 7:30 am – 5:00 pm      **Transportation included; Lunch included**

The WIPP is the only U.S. deep geological repository licensed to permanently dispose of the nation's defense-related transuranic waste. The waste have been emplaced in a 2,000 ft.-deep salt basin formed during the Permian Period approximately 250 million years ago. Located in the Chihuahuan Desert, approximately 26 miles east of Carlsbad, NM, WIPP began disposal operations in March 1999. Two incidents forced disposal operations to stop in February 2014. After a nearly 3-year recovery process, the WIPP has been resuming activities this year.

The Tour will include an extensive presentation of the WIPP mission, achievements and challenges. It will take place at the site. A visit of the key areas at the surface of the site will be followed with a unique tour of the underground, should this latter not interfere with the operations going on that day.

This free event is open to registered meeting attendees who signed up at the time of registration, provided the additional information requested by the site (if any), and received final approval.



*Courtesy of the Department of Energy, Carlsbad Field Office (DOE-CBFO)*

# Plenary, Special Sessions & Events

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## FRIDAY, SEPTEMBER 15 CONTINUED

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### Technical Tour-B: URENCO + Waste Control Specialists (WCS) Tour

**Time:** 7:30 am – 5:00 pm      **Transportation included; Lunch included**

This Technical Tour will combine two exceptional facilities located at the New Mexico-Texas border, approximately 75 miles east of Carlsbad, NM: the URENCO Enrichment Facility, and the Waste Control Specialists (WCS) Facility.

URENCO USA is the first enrichment facility to be built in the U.S. in 30 years and the first ever using centrifuge enrichment technology. The URENCO USA facility began operations on June 2010. At the end of December 2016, capacity at URENCO USA stood at 4,700 tSW/a. It is anticipated that at full planned 5,700 tSW/a capacity, the facility will produce sufficient enriched uranium for nuclear fuel to provide approximately 7% of America's electricity needs.

Located within a 1,200-ft. thick nearly impermeable red-bed clay formation, the Waste Control Specialists (WCS) site ensures secure, compliant, safe and permanent disposal of radioactive waste by combining this unique natural barrier with a custom designed and engineered, 7-ft. thick, steel-reinforced concrete liner system. WCS operates a fully licensed 1,338-acre facility located on a 14,900-acre site in western Andrews County, Texas.

This free event is open to registered meeting attendees who signed up at the time of registration, provided the additional information requested by the site (if any), and received final approval.



*Courtesy of the Waste Control Specialists (WCS)*



# Plenary, Special Sessions & Events

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## FRIDAY, SEPTEMBER 15 CONTINUED

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### Excursion: Carlsbad Caverns

**Time:** 9:00 am – your time **Lunch included; Transportation on your own (organizers can help)**

We invite you to discover (or re-discover) the remarkable Carlsbad Caverns National Park! Beneath the scenic and rugged Chihuahuan Desert, in the rocky slopes and deep canyons of Guadalupe Mountain range, sit the largest chambered cavern in North America, and other underground wonders! Above grounds, around sunset time, the ballet of hundreds of thousands of bats will leave you amazed!

Your Carlsbad Caverns Excursion will include the following:

- The outstanding Big Room, which you can access either hiking down a 1.25 mile paved trail through the cave's Natural Entrance, or ... taking an elevator ride!
- The beautiful King's Palace, the deepest portion of the cavern open to the public. On this ranger-guided tour, you will leisurely stroll through 4 naturally decorated chambers of the cave. You will also experience the natural darkness of the cave, when the ranger conducts the impressive "black-out"!
- Should you decide to stay until dark, the spectacular Bat Flight program will take place at dusk, when thousands of bats exit the cave to look for food.

General information on the Carlsbad Caverns National Park can be found at <https://www.nps.gov/cave/index.htm>.

This free event is open to registered meeting attendees who signed up at the time of registration. Additional tickets are available for purchase at the following cost: \$25.



*Courtesy of the National Park Service, Carlsbad Caverns*

## Technical Sessions: Monday September 11

### MONDAY, SEPTEMBER 11

#### TECHNICAL SESSIONS - 1:20 PM

##### Experiment Needs/Proposals

**Session Organizer:** Dr. John Darrell Bess (*INL*), **Co-chairs:** Angela Chambers (*NNSA*), Kent Wood (*NRC*)

**Time:** 1:20 - 2:00 pm

**1:20 pm:** Thermal/Epithermal Experiments with Hafnium (TEX-Hf), Anthony J. Nelson, Catherine M. Percher, William J. Zywiec, David P. Heinrichs (*LLNL*)

**1:40 pm:** Use of Advanced Optimization Algorithms for the Design of Critical Experiments, Nicolas Leclaire (*IRSN (French Institute for Nuclear Safety)*), Mathieu Monestier (*URANUS*), Isabelle Duhamel (*IRSN*)

##### Validation/Applicability Studies I

**Session Organizer:** Dr. John Darrell Bess (*INL*), **Co-chairs:** Angela Chambers (*NNSA*), Kent Wood (*NRC*)

**Time:** 2:00 - 3:00 pm

**2:00 pm:** Validation and Bias Quantification of Criticality Safety Codes for Srms Operations, Scott Finrock (*Fluor Government Group*), David G. Erickson (*Savannah River Nuclear Solutions (SRNS)*), Tracy E. Stover (*Savannah River Nuclear Solutions, LLC*)

**2:20 pm:** Validation of MVP Code with HTC Critical Experiments, Shigeki Shiba (*Nuclear Regulation Authority*), Tomohiro Sakai (*NRA*)

**2:40 pm:** Convergence of Correlation Coefficients of Critical Experiments Derived by Monte Carlo Sampling, Maik Stuke, Fabian Hans Dominik Sommer (*Gesellschaft für Anlagen und Reaktorsicherheit gGmbH*)

##### Validation/Applicability Studies II

**Session Organizer:** Dr. John Darrell Bess (*INL*), **Co-chairs:** Nicolas Leclaire (*IRSN*), Hannah Morbach (*CNS*)

**Time:** 3:20 - 5:00 pm

**3:20 pm:** Results of TRIPOLI-4 Version 10 on TRIPOLI Criticality Validation Suite, Thermal Spectra, Jean-Christophe P. Trama, Fadhel Malouch (*CEA*)

**3:40 pm:** Evaluation of SCALE 6.1.2 Tsunami Module for Selection of Representative Benchmarks for Validation of Criticality Safety Studies, David Noyelles, Emmanuel Gagnier (*CEA*)

**4:00 pm:** Development of Criticality Safety Validation Guidance for NRC-Regulated Activities, William J. Marshall, Donald E. Mueller, Justin B. Clarity, Stephen M. Bowman (*ORNL*)

**4:20 pm:** Simulated Rossi-Alpha Analysis of an Asymmetrically Coupled Bare Metal HEU Reactor System, Kimberly L. Klain (*LANL*)

**4:40 pm:** Investigations into Validation of Plutonium Solutions for Criticality Safety Analysis, Jennifer L. Alwin, Forrest B. Brown, Alicia Salazar-Crockett, Michael E. Rising (*LANL*)



## TUESDAY, SEPTEMBER 12

### TECHNICAL SESSIONS - 8:20 AM

#### Burnup Credit I

**Session Organizer:** Dr. Kaushik Banerjee (ORNL), **Co-chairs:** Kaushik Banerjee (ORNL), William J. Marshall (ORNL)

**Time:** 8:20 - 10:00 am

**8:20 am:** Application of Peaking Factor Credit in Spent Fuel Pool Criticality Analysis, Charles T. Rombough (CTR Technical Services, Inc.), Dale B. Lancaster (NuclearConsultants.com), Matt C. Harris (NETCO - Curtiss Wright)

**8:40 am:** Fuel Pin Zoning to Improve the Accuracy of the Palisades Spent Fuel Pool Criticality Analysis, Charles T. Rombough (CTR Technical Services, Inc.), Dale B. Lancaster (NuclearConsultants.com), Tom Wiggins (Entergy)

**9:00 am:** An Assessment of Total Depletion Uncertainties for a GBC-32 Dry Storage Cask with Plus7 Fuels Using Monte Carlo Sampling and Two-Way Anova F-Test, Ser Gi Hong, Hyungju Yun, Kwangheon Park (Kyung Hee University)

**9:20 am:** Sensitivity and Uncertainty Analysis for a Combined Depletion and Criticality Calculation Chain of a BWR FA, Fabian Hans Dominik Sommer, Volker Hannstein (GRS, Germany)

**9:40 am:** Impact of Grid Growth on PWR Spent Fuel Pool Criticality Analysis, Dale B. Lancaster (NuclearConsultants.com), Charles T. Rombough (CTR Technical Services, Inc.)

#### Burnup Credit II

**Session Organizer:** Dr. Kaushik Banerjee (ORNL), **Co-chairs:** Henrik Liljenfeldt (ORNL), Justin B. Clarity (ORNL)

**Time:** 10:20 - 11:00 am

**10:20 am:** Impact of Assembly-Specific Conditions on BWR Burnup Credit, Brian J. Ade, William J. Marshall, Stephen M. Bowman (ORNL)

**10:40 am:** A Burnup Credit Approach for Margin Estimation of Loaded Boiling Water Reactor Canisters in UNF-ST&DARDS, Justin B. Clarity, Kaushik Banerjee, William J. Marshall, Henrik Liljenfeldt (ORNL)

#### Storage, Transportation, and Disposal of Fissile Materials

**Session Organizer:** Dr. Kaushik Banerjee (ORNL), **Co-chairs:** Henrik Liljenfeldt (ORNL), Justin B. Clarity (ORNL)

**Time:** 11:00 am - 12:00 pm

**11:00 am:** Investigation of Reactivity Differences in Cylinder Arrays Using Various Mass Fill Geometries with Constant Mass, Quentin T. Newell (URENCO USA), Charlotta E. Sanders (d/b/a Sanders Engineering)

**11:20 am:** Investigation of Reactivity Differences in UF6 Cylinder Arrays with Different Masses at Various Mist Conditions, Charlotta E. Sanders (d/b/a Sanders Engineering), Quentin T. Newell (URENCO USA)

**11:40 am:** Which Parameters Might Help to Predict an Impact on Reactivity for Mixed Fissile Units in a Storage Array?, Mathieu Milin (IRSN (French Institute for Nuclear Safety)), Sacko Mariame (Ausy)

Technical  
Sessions:  
Tuesday  
September  
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## Technical Sessions: Tuesday September 12

### TUESDAY, SEPTEMBER 12 TECHNICAL SESSIONS - 1:20 PM

#### Criticality Safety – General I

**Session Organizer:** Dr. Kevin H. Reynolds (*Y-12 NSC*), **Co-chairs:** Jennifer Alwin (*LANL*), Alfie O'Neill (*National Nuclear Laboratory*)

**Time:** 1:20 - 3:00 pm

**1:20 pm:** Atalante Research Facility- Implementation of a Rule of Fractions for the Management of Reflecting Materials in Mass-Limited Units, Laurent Cholvy, Beatrice Batifol, David Noyelles (*CEA*)

**1:40 pm:** Criticality Accident Intervention: a Slide-Rule for Dose Estimation, Michael Laget, Emmanuel Gagnier (*CEA*)

**2:00 pm:** A Novel Approach to Criticality Accident Detection for a Legacy Facility, Sonny Gan, Andrew Malcolm Sutton (*Sellafield Ltd*)

**2:20 pm:** Developing a New Criticality Methodology to Support Decommissioning of Legacy Plutonium facilities, Andrew Malcolm Sutton (*Sellafield Limited*)

**2:40 pm:** Consistent Criticality Safety Approach to Nuclear Sites, External Transport, and Final Disposal, Dennis E. Mennerdahl (*E Mennerdahl Systems*)

#### Criticality Safety – General II

**Session Organizer:** Dr. Kevin H. Reynolds (*Y-12 NSC*), **Co-chairs:** Lawrence J. Berg (*NNSA*), Dennis Mennerdahl (*E Mennerdahl Systems*)

**Time:** 3:20 - 5:00 pm

**3:20 pm:** The Potential NCS Issue Process - A Method to Screen Emerging Issues, Kristan M. Wessels (*Y-12 NSC*), Christopher F. Haught (*CNS*), V. Tom Young (*Y-12 NSC*)

**3:40 pm:** Improving Nuclear Criticality Safety in Maintenance and Construction Activities at Y-12 National Security Complex, Travis L. Wilson (*CNS*)

**4:00 pm:** DELETED

**4:20 pm:** Criticality Accident Dosimetry at CEA Facilities: Use of SNAC2 Type Neutron Zone Spectrometer, Pierre Casoli, Emmanuel Gagnier, Michael Laget, Laurence Lebaron-Jacobs (*CEA*)

**4:40 pm:** Seventy-Five Years of Nuclear Criticality Safety Documents--A Bibliography, Brian L. Koponen, David P. Heinrichs, Chuck K. Lee (*LLNL*)



Courtesy of the Living Desert Zoo & Gardens State Park

## WEDNESDAY, SEPTEMBER 13

### TECHNICAL SESSIONS - 8:20 AM

#### Information Access

**Session Organizer:** Dr. John D. Bess (*INL*), **Co-chairs:** Michael Zerkle (*NNL*), Margaret Marshall (*INL*)

**Time:** 8:20 - 8:40 am

**8:20 am:** Additions to the ICSBEP and IRPhEP Handbooks since NCSD 2013, John Darrell Bess, Margaret Marshall (*INL*), J. Blair Briggs (*INL, retired*), Tatiana Ivanova (*OECD Nuclear Energy Agency*), Ian P. Hill (*Nuclear Energy Agency*), Nigel (Jim) T. Gulliford (*OECD/NEA*)

#### Nuclear Data (Including ENDF/BVIII) and Libraries

**Session Organizer:** Dr. John D. Bess (*INL*), **Co-chairs:** Michael Zerkle (*NNL*), Margaret Marshall (*INL*)

**Time:** 8:40 - 9:40 am

**8:40 am:** Benchmarking of Activation Rates in Special Core in LR-0 Reactor, Michal Kostal (*Research Center Rez*), Vlastimil Junicek (*Research Center Rez*), Evzen Losa (*UJV - Nuclear Research Institute, Rez*), Vojtěch Rypar (*Research Center Rez*)

**9:00 am:** ENDF/B-VIII.0 Testing with AMPX and SCALE, Andrew M. Holcomb, Doro Wiarda, William J. Marshall (*ORNL*)

**9:20 am:** The Thermal Neutron Scattering Law for Hydrogen Bound in Plutonium Dihydride and Predicted Critical Mass for Several Configurations, Michael L. Zerkle, Jesse C. Holmes, Adam G. Nelson (*Naval Reactors*)

#### Spent Nuclear Fuel and Other Fissile Materials Criticality Safety from Applicants and Regulators Perspective

**Session Organizer:** Dr. Kaushik Banerjee (*ORNL*), **Co-chairs:** Michael Zerkle (*NNL*), Margaret Marshall (*INL*)

**Time:** 9:40 - 10:00 am

**9:40 am:** Accident Analysis of Spent Fuel Storage and Transportation Cask with Gd Based Neutron Absorber, Mijin Kim, Dong-Seong Sohn (*UNIST*)



Courtesy of the City of Carlsbad, NM

Technical  
Sessions:  
Wednesday  
September  
13

## Technical Sessions: Wednesday September 13

### WEDNESDAY, SEPTEMBER 13

#### TECHNICAL SESSIONS - 10:20 AM

##### Qualification Programs

**Session Organizer:** Dr. Douglas G. Bowen (*ORNL*), **Co-chairs:**

Douglas G. Bowen (*ORNL*), Ellen M. Saylor (*ORNL*)

**Time:** 10:20 - 11:20 am

**10:20 am:** Developing a Streamlined Approach to Criticality Safety Analyst Training/Qualification, Alicia Salazar-Crockett, Mary Beth Lujan, Andrew R. Wysong (*LANL*)

**10:40 am:** Safety Analysis Report for Packaging (SARP) Shielding & Nuclear Criticality Safety Generalist and Analyst Courses Developed and Conducted by Oak Ridge National Laboratory, Douglas G. Bowen, Joel M. Risner, Brian L. Broadhead, Ellen M. Saylor, Cecil V. Parks (*ORNL*)

**11:00 am:** Current Status of the DOE/NNSA Nuclear Criticality Safety Program Hands-On Criticality Safety Training Courses, Douglas G. Bowen (*ORNL*)

##### University Initiatives/Courses/Distance Educ

**Session Organizer:** Dr. Douglas G. Bowen (*ORNL*), **Co-chairs:**

Douglas G. Bowen (*ORNL*), Ellen M. Saylor (*ORNL*)

**Time:** 11:20 am - 12:00 pm

**11:20 am:** A Perfect Amalgam - The Combination of Company In-house Training with an Academic Online Certificate Program, Charlotta E. Sanders (*d/b/a Sanders Engineering*), Quentin T. Newell (*URENCO USA*)

**11:40 am:** Los Alamos National Laboratory Nuclear Criticality Safety Pipeline for Expedited Qualification of Personnel, Andrew R. Wysong, Mary Beth Lujan, Alicia Salazar-Crockett, Travis A. Smith (*LANL*)

##### Criticality Safety – General III

**Session Organizer:** Dr. Kevin H. Reynolds (*Y-12 NSC*), **Co-chairs:**

Kevin Hahn (*NNSA*), Forrest Brown (*LANL*)

**Time:** 1:20 - 3:00 pm

**1:20 pm:** Creation of a Database Dedicated to Nuclear Criticality Events that Occurred in Fuel Cycle Facilities, Regis Cousin (*IRSN (French Institute for Nuclear Safety)*)

**1:40 pm:** Computational Study of Critical Mass Curves for Various Ratios of <sup>238</sup>Pu to <sup>239</sup>Pu, Alan Joseph Yamanaka, Natasha N. Glazener (*LANL*)

**2:00 pm:** Characteristics of Concrete Reflection of U-235 Systems, Richard G. Taylor, Ronald E. Pevey (*Univ. of Tennessee*)

**2:20 pm:** A Perspective on the Interaction Between the NCSD and ANSI/ANS-8 Standards, John A. Miller (*SNL*), Robert D. Busch (*Univ. of New Mexico*), Douglas G. Bowen (*ORNL*), Larry L. Wetzel (*BWX Technology*)

**2:40 pm:** Seventy-Five Years of Nuclear Criticality Safety Documents-A Bibliography, Part II--Online Links to Full-Text Documents, Brian L. Koponen, Chuck K. Lee, David P. Heinrichs (*LLNL*)



## WEDNESDAY, SEPTEMBER 13

### TECHNICAL SESSIONS - 3:20 PM

#### Disposal Criticality and Criticality Consequence Analysis in the Disposal Time Frame

**Session Organizer:** Dr. Kaushik Banerjee (*ORNL*), **Co-chairs:** Kaushik Banerjee (*ORNL*), Dale Lancaster (*NuclearConsultants.com*)

**Time:** 3:20 - 3:40 pm

**3:20 pm:** Criticality Effects of Long-Term Changes in Material Compositions and Geometry in Disposal Canisters, Fredrik Sten Johansson (*SKB*), Kastriot Spahiu (*Swedish Nuclear Fuel and Waste Management Co.*), Lennart Agrenius (*Agrenius Consulting*)

#### Fuel Fabrication and Operational Practices

**Session Organizer:** Dr. Kaushik Banerjee (*ORNL*), **Co-chairs:** Kaushik Banerjee (*ORNL*), Dale Lancaster (*NuclearConsultants.com*)

**Time:** 3:40 - 4:20 pm

**3:40 pm:** Means and Procedures for Stopping a Criticality Accident in the Melox Homogeniser, Olivier Ravat, Alexandre Tassis (*AREVA NC MELOX*)

**4:00 pm:** Demonstrating Compliance with Moderator Content Limits in Uranium Dioxide Powder upon Leaving a Furnace Environment, A. O'Neill (*National Nuclear Laboratory - Preston Laboratory*)

#### Student Competition

**Session Organizer:** Dr. Douglas G. Bowen (*ORNL*), **Chair:** Douglas G. Bowen (*ORNL*)

**Time:** 4:20 - 5:00 pm

**4:20 pm:** Characterization of Accumulated Nuclear Spent Fuel in South Korea with Scenario Study, GyeongMi Kim, Ser Gi Hong, GeonHee Jung (*Kyung Hee University*), Dae Sik Yook (*KINS*)

**4:40 pm:** Refinements of a Treat Model for Transient Analysis, Zachary J. Weems (*Univ. of Florida*), Mark David DeHart (*INL*), Sedat Goluoglu (*Univ. of Florida*)



Courtesy of the National Park Service, Carlsbad Caverns

Technical  
Sessions:  
Wednesday  
September  
13



## Technical Sessions: Thursday September 14

### THURSDAY, SEPTEMBER 14

#### TECHNICAL SESSIONS - 8:20 AM

##### Criticality Safety – General IV

**Session Organizer:** Dr. Kevin H. Reynolds (*Y-12 NSC*), **Co-chairs:** Kristan Wessels (*Y-12 NSC*), Lawrence J. Berg (*NNSA*)

**Time:** 8:20 - 9:40 am

**8:20 am:** Overview and Status of Domestic and International Standards for Nuclear Criticality Safety, Douglas G. Bowen (*ORNL*)

**8:40 am:** Applying Whisper Results to Traditional USL Calculational Methods, Shawn J. Henderson (*SNL*), John A. Miller (*Sandia National Labs*)

**9:00 am:** Criticality Detection Method Based on Measurement of FP Gamma Radiations, Kazuo Azekura, Yoshitaka Naito (*NAIS Co., Inc.*)

**9:20 am:** An Evaluation of In-Line Component Process Modules, Hannah Morbach (*Consolidated Nuclear Security*), Marc Rosser (*Y-12 NSC*)

##### Accident Analysis and Alarm Systems

**Session Organizer:** Mr. Lawrence J. Berg (*NNSA*), **Co-chairs:** Kristan Wessels (*Y-12 NSC*), Lawrence J. Berg (*NNSA*)

**Time:** 9:40 - 10:00 am

**9:40 am:** Introduction of Plutonium Systems to the Nuclear Criticality Slide Rule, Matthieu Duluc (*IRSN (French Institute for Nuclear Safety)*), David P. Heinrichs, Soon Sam Kim (*LLNL*), Thomas M. Miller, Cihangir Celik, Calvin M. Hopper (*ORNL*), Alex Brown (*Atomic Weapons Establishment*), Christopher L. Wilson (*AWE Plc*), Marc Troisne (*Millennium*)

##### Methods and Software Development I

**Session Organizer:** Dr. John D. Bess (*INL*), **Co-chairs:** Deborah A. Hill (*National Nuclear Laboratory*), John A. Miller (*Sandia National Labs*)

**Time:** 10:20 am - 12:00 pm

**10:20 am:** Release of MCNP6.2 & Whisper-1.1 - Guidance for NCS Users, Forrest B. Brown, Michael E. Rising, Jennifer L. Alwin (*LANL*)

**10:40 am:** CRISTAL V2: New Package for Criticality Calculations, Jean-Michel Gomit (*Institut de Radioprotection et de Surete*), Isabelle Duhamel, Yann Richet (*IRSN/France*), Arnaud Entringer, Christine Magnaud, Fadhel Malouch, Coralie Carmouze (*CEA/France*)

**11:00 am:** Using Whisper-1.1 to Guide Improvements to Nuclear Data Evaluations, Michael E. Rising, Forrest B. Brown, Jennifer L. Alwin (*LANL*)

**11:20 am:** Determination of Critical Experiment Correlations for Experiments Involving High-Enriched Uranium Solutions, William J. Marshall, Bradley T. Rearden (*ORNL*), Ronald E. Pevey (*Univ. of Tennessee*)

**11:40 am:** Determination of Critical Experiment Correlations for Experiments Involving Arrays of Low-Enriched Fuel Rods, William J. Marshall, Bradley T. Rearden (*ORNL*), Ronald E. Pevey (*Univ. of Tennessee*)

**THURSDAY, SEPTEMBER 14**  
**TECHNICAL SESSIONS - 1:20 PM**

**Methods and Software Development II**

**Session Organizer:** Dr. John D. Bess (INL), **Co-chairs:** William J. Marshall (ORNL), Christopher M. Perfetti (ORNL)

**Time:** 1:20 - 2:20 pm

**1:20 pm:** Template Engine Applied to Rapid Modeling, Robert Lefebvre, William J. Marshall (ORNL)

**1:40 pm:** FULCRUM User Interface for SCALE 6.2, Robert Lefebvre, Adam B. Thompson, Brandon Langley, Bradley T. Rearden (ORNL)

**2:00 pm:** Verification Suite for the Application of the Limiting Surface Density Method to Arrays of 9975 Packages, James S. Baker, Michael D. Ratliff, Tracy E. Stover (Savannah River Nuclear Solutions, LLC)

**Technical  
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*Courtesy of the Department of Energy, Carlsbad Field Office (DOE-CBFO)*



# ANS NCSD



## 2017 NCSD

### Nuclear Criticality Safety Division Topical meeting

Criticality Safety – pushing boundaries by modernizing and integrating data, methods, and regulations

September 10-15, 2017  
Pecos River Village Conference Center  
Carlsbad, NM



*Courtesy of the Department of Energy, Carlsbad Field Office (DOE-CBFO)*