

Mr. Peter S. Hastings  
Licensing Manager  
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P.O. Box 31847  
Charlotte, NC 28231

November 9, 2001

SUBJECT: NUCLEAR CRITICALITY SAFETY STAFF QUALIFICATIONS AND  
ADMINISTRATIVE MARGINS FOR FUEL FABRICATION FACILITIES

Dear Mr. Hastings:

The purpose of this letter is to provide you with a summary of nuclear criticality safety (NCS) requirements that have been approved during U.S. Nuclear Regulatory Commission (NRC) licensing and certification actions for NRC-regulated fuel cycle facilities. The enclosures include a summary of the: (1) NCS staff qualifications; and (2) administrative margins for use in performing NCS calculations currently contained in NRC regulated fuel cycle facility licenses. This information was requested during the October 11, 2001, meeting to discuss Duke Cogema Stone and Webster's (DCS') response to the NRC Request for Additional Information (RAI), dated August 31, 2001.

Sincerely,

**/RA/**

Andrew Persinko, Sr. Nuclear Engineer  
Special Projects Branch  
Division of Fuel Cycle Safety  
and Safeguards  
Office of Nuclear Material Safety  
and Safeguards

Docket: 70-3098

Enclosures:

1. NCS Staff Qualifications
2. Administrative Margins

cc:

J. Johnson, DOE  
H. Porter, SCDHEC  
J. Conway, DNFSB  
D. Moniak, BREDL  
G. Carroll, GANE

R. Thomas, Environmentalists, Inc.  
Mr. Peter S. Hastings  
Licensing Manager  
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**K-eff License Application/Certificate Requirements for Normal and Credible Abnormal Conditions (MoS = Margin of Subcriticality)**

Licensee/Certificate Holder	Normal Conditions	Credible Abnormal Conditions
<b>HEU Facilities</b>	XXXXXXXXXXXXXXXXXXXXX XXXXXXX	XXXXXXXXXXXXXXXXXXXXX XXXXXXX
<i>BWXT-LYN (Rev. dated 08/18/1999)</i> (The Limiting Condition of Operation (LCO) value shall be determined after consideration of credible accident scenarios consistent with the DCP.)	The k-eff for the LCO shall not exceed 0.94 for LEU (enriched $\leq 10$ wt.% U-235) systems and shall not exceed 0.92 for HEU (enriched $\geq 10$ wt.% U-235) systems.	The k-eff for the Safety Limit shall not exceed 0.97 for LEU (enriched $\leq 10$ wt.% U-235) systems and shall not exceed 0.95 for HEU (enriched $\geq 10$ wt.% U-235) systems.
<i>NFS-ERW (Rev. 2, 10/23/1998)</i> (Method #1 is complicated.)	Method #2: $k\text{-eff} + 2\sigma - \text{bias} \leq 0.90$	Method #2: $k\text{-eff} + 2\sigma - \text{bias} \leq 0.95$ , for failure of a single contingency
<b>GDP Facilities</b>	XXXXXXXXXXXXXXXXXXXXX XXXXXXX	XXXXXXXXXXXXXXXXXXXXX XXXXXXX
<i>USEC-PGDP (Rev. 55, 03/19/2001)</i> (minimum MoS = 0.02) (95/99.9 k-eff, Rev. 46, 04/14/2001)	$k\text{-eff} \leq 0.9634$ , which includes the bias, uncertainty, and the MoS	$k\text{-eff} \leq 0.9634$ , which includes the bias, uncertainty, and the MoS
<i>USEC-PORTS (Rev. 5, 08/01/1996)</i> (minimum MoS = 0.02) (95/99.9 k-eff, Rev. 3, 05/31/1998)	$k\text{-eff} \leq 0.9605$ , which includes the bias, uncertainty, and the MoS	$k\text{-eff} \leq 0.9605$ , which includes the bias, uncertainty, and the MoS
<b>LEU Facilities</b>	XXXXXXXXXXXXXXXXXXXXX XXXXXXX	XXXXXXXXXXXXXXXXXXXXX XXXXXXX
<i>FCF-LYN (Rev. 10, 09/16/1998)</i> (minimum MoS = 0.02)	$k\text{-eff} + 2\sigma - \text{bias} \leq 0.87$	$k\text{-eff} + 2\sigma - \text{bias} \leq 0.95$
<i>FCF-RCH (Rev. dated 10/28/1996)</i>	$k\text{-eff} = k\text{-calc} - 2\sigma - \text{bias} - 0.05$	$k\text{-eff} = k\text{-calc} - 2\sigma - \text{bias} - 0.03$
<i>GNFA-WIL (Rev. 2, 09/19/1997)</i>	$k\text{-eff} + 3\sigma - \text{bias} \leq 0.97$	$k\text{-eff} + 3\sigma - \text{bias} \leq 0.97$
<i>WEC-COL (Rev. 18, 07/01/2000)</i>	95/95 k-eff = $k\text{-c} + 2\sigma + (\text{bs} + \text{unc.})$ , $\leq 0.95$	95/95 k-eff = $k\text{-c} + 2\sigma + (\text{bs} + \text{unc.})$ , $\leq 0.98$

<i>WEC-HEM (Rev. 3, 07/10/1998)</i>	k-eff $\leq$ 0.95 including applicable uncertainties and biases	k-eff $\leq$ 0.95 including applicable uncertainties and biases
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### NCS Qualification at Parts 70 and 76 facilities

Facility	NCS Manager	Level II NCS Engineer	Level I NCS Engineer
Draft 10 CFR Part 70 SRP	(1) BS/BA or equivalent; and (2) technical experience in NCS at a similar facility	(1) BS in science or engineering; and (2) 3 years experience in NCS	(1) BS in science or engineering; and (2) 1 years experience in NCS
MOX SRP	N/A, but should be as above: (1) BS/BA or equivalent; and (2) technical experience in NCS at a similar facility	N/A, but should be as above: (1) BS in science or engineering; and (2) 3 years experience in NCS	N/A, but should be as above: (1) BS in science or engineering; and (2) 1 years experience in NCS
Draft GDP SRP	N/A, but should be as above: (1) BS/BA or equivalent; and (2) technical experience in NCS at a similar facility	N/A, but should be as above: (1) BS in science or engineering; and (2) 3 years experience in NCS	N/A, but should be as above: (1) BS in science or engineering; and (2) 1 years experience in NCS
BWXT-LYN	(1) BS/BA degree in a physical science or engineering; and (2) met one of the following: (a) 2 years experience as an NCS Engineer at this site; or (b) 3 years experience as an NCS Engineer at another nuclear site	(1) BS/BA degree in a physical science or engineering; and (2) met one of the following: (a) 1 years experience as a Level I NCS Engineer performing NCS evaluations at this site under the direct supervision of a Level II NCS Engineer or the NCS Manager; or (b) 2 years experience performing NCS safety evaluations in connection with SNM handling facilities; or (c) 2 years experience performing reactor physics calculations and 1 years experience in connection with SNM handling facilities; or (d) MS degree in physics or nuclear engineering and six months experience performing NCS evaluations at this site under the direct supervision of a Level II NCS Engineer or the NCS Manager	(1) BS/BA degree in a physical science or engineering

FRAM-LYN	(1) BS/BA degree in science or engineering; and (2) 5 years experience in applied health physics along with sufficient formal training that provides an understanding of the health physics and nuclear safety hazards involved at this site; and (3) demonstration of sufficient judgement and capability to establish and maintain an effective NCS and radiation safety program [Note: This is the position of Manager of Radiation Protection]	(1) BS/BA degree in science or engineering; and (2) met one of the following: (a) 2 years experience in reactor physics and 1 years experience in NCS analyses; or (b) 2 years experience performing NCS analyses; or (c) MS degree in nuclear engineering and 1 years experience performing NCS analyses	N/A because no such position exists at this facility
FRAM-RCH	(1) BS/BA degree in science or engineering; and (2) 5 years experience which was to develop an understanding of the health, safety, and environmental aspects of SNM processing activities [Note: This is the position of Manager of Health, Safety, and the Environment]	(1) BS/BA degree in science or engineering; and (2) 3 years experience in NCS analysis	(1) BS/BA degree in science or engineering; and (2) successful completion of a formal internal training and qualification program
GNFA-WIL	(1) BS/BA degree in science or engineering; and (2) 4 years experience in assignments involving regulatory activities; and (3) have experience in the understanding, application, and direction of NCS programs	(1) BS/ BA degree in science or engineering; and (2) 3 years of nuclear industry experience in NCS; and (3) have experience in NCS	(1) BS/BA degree in science or engineering; and (2) have experience in NCS
NFS-ERW	(1) BS/BA degree in nuclear science or engineering; and (2) 3 years of experience in NCS	(1) BS/BA degree in nuclear science or engineering; and (2) 3 years experience in NCS work	(1) BS/BA degree in nuclear science or engineering; and (2) 1 years experience in NCS work

PGDP-PDKY	(1) BS/BA degree in engineering or the physical sciences; or equivalent technical experience; and (2) 4 years of nuclear experience with 6 months at a uranium processing facility where NCS was practiced	(1) completed minimum requirements for Level I NCS Engineer; and (2) performance of Level I NCS activities; and (3) completion of 1 year as a Level I NCS Engineer; and (4) 2 years NCS experience at this site; and (5) approval by the NCS Manager, however, the NCS Manager may modify this for personnel who have worked 5 consecutive years at other sites as an NCS Engineer	(1) BS/BA in engineering, mathematics, or related sciences; and (2) 1 years experience performing NCS work at this site; and (3) completion of NCS training course and KENO V.a course; and (4) performance of four NCS evaluations under a Level II NCS Engineer; and (5) performance of walk-through inspections under a Level I NCS Engineer; and (6) receive NCS surveillance team training; and (7) if no nuclear engineering or physics background, then 1 years training in physics of NCS and associated safety practices, however, the NCS Manager may modify this if there is 3 consecutive years experience as an NCS Engineer at another site
PORTS-PTOH	(1) BS/BA degree in engineering or the physical sciences; or equivalent technical experience; and (2) 4 years of nuclear safety experience with 6 months at a uranium processing facility where NCS was practiced	(1) completed minimum requirements for Level I NCS Engineer; and (2) performance of four technical reviews under a Level II NCS Engineer or the NCS Manager; and (3) completion of 1 year as a Level I NCS Engineer; and (4) 2 years NCS experience at a GDP site; and (5) approval by the NCS Manager, however, the NCS Manager may modify this for personnel who have worked 5 consecutive years at other sites as an NCS Engineer	(1) BS/BA in engineering, mathematics, or related sciences; and (2) 1 years experience performing NCS work at this site; and (3) completion of NCS training course and KENO V.a course or equivalent; and (4) performance of four NCS evaluations under a Level II NCS Engineer; and (5) performance of walk-through inspections under a Level I NCS Engineer; and (6) if no nuclear engineering or physics background, then 1 years training in physics of NCS and associated safety practices, however, the NCS Manager may modify this if there is 3 consecutive years experience as an NCS engineer at another site

WEC-COL	(1) BS/BA degree with biological science, physical science, or engineering emphasis; and (2) 2 years experience in assignments involving regulatory activities; and (3) demonstrated proficiency in quality administration of NCS	(1) BS/BA degree or equivalent with science or engineering emphasis; and (2) 2 years of nuclear industry experience in NCS; and (3) demonstrated proficiency in quality administration of NCS	N/A because no such position exists at this facility
WEC-HEM	(1) BS/BA degree in science or engineering; and (2) 1 week NCS training course; and (3) 4 years experience in health physics with 2 years in one of four health physics areas [Note: This is the position of Manager of NCS and Health Physics]	(1) BS/BA degree in science or engineering; and (2) 2 years experience in NCS evaluations with six months applicable to fuel manufacturing	N/A because no such position exists at this facility