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Lawrence Livermore Laboratory

U.S.NRC/LLL LIAISON WITH THE FEDERAL REPUBLIC OF GERMANY FOR THE GKSS-PSS
STEAM CONDENSATION TESTS - PROGRESS REPORT NO. 2

Garry S. Holman

September 13, 1979

U.S.NRC/LLL Liaison with the Federal Republic of Germany for
the GKSS=PSS Steam Condensation Tests

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ABSTRACT

This second progress report for the USNRC/LLL liaison program with the Federal Republic of Germany regarding boiling water reactor containment multivalent steam condensation tests being conducted by GKSS addresses program activity during the period of July-August, 1979. During this period, the first digital data, video tapes, and complete report for test VM1 were received, together with various computer software used by GKSS for data reduction. Document handling procedures were finalized in order to protect the proprietary nature of information received from GKSS and several translations were obtained.

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INTRODUCTION

The Lawrence Livermore Laboratory is currently engaged as the principle liaison for the United States Nuclear Regulatory Commission (USNRC) for full-scale multiple-vent steam condensation tests being performed at the GKSS* test facility located in the Federal Republic of Germany. The general objective of this program is to provide confirmatory data for use by the NRC in the licensing of power plants using the General Electric Mark II boiling water reactor containment. Of primary interest is the response of the BWR pressure suppression system during the late-time steam condensation phase of a hypothetical loss-of-coolant accident (LOCA).

This report addresses progress made in the GKSS program during the period 16 July through 5 September 1979. A more complete discussion of the background scope of the program is provided in the first GKSS progress report (1).

STATUS OF TECHNICAL DOCUMENTS

Table 1 provides a summary of the status of GKSS technical reports received to date. This summary includes the title and author of each report, as well as the cost of translation and the current availability of the document. Where available, our own estimated translation costs, based on information supplied by our Technical Information Department (TID), are included for comparison with the actual costs charged by our outside translation agency (AD-EX International, Portola Valley, Calif.). In general, our estimates have been close to actual charges.

*Gessellschaft für Kernenergieverwertung in Schiffbau und Schifffahrt mbH.

Except in a very few cases specifically designated by GKSS, all technical reports are being handled as proprietary documents. In order to protect this proprietary status, procedures have been implemented which we feel follow the guidelines of the Laboratory. As discussed in Ref. (2), a stamped notice of proprietary restriction is affixed to each German-language report before it is sent out for translation. A second cover sheet, also stamped with the proprietary notice, is also included to be attached by the translation agency to the English-language translation. By agreement with TID, no library listings are made of either report titles or report contents for dissemination outside of the Laboratory. Internal distribution is limited to the GKSS program staff and to TID, which maintains a vault copy of all translations. In any case, GKSS documents or their translations are not included in the "new titles" listings periodically circulated within the Laboratory by TID.

Overall, the handling of technical reports provided by GKSS is proceeding smoothly.

Table 1

GKSS DOCUMENT STATUS SUMMARY

Reference: USNRC FIN AG118

August 31, 1979

<u>Title (a)</u>	<u>Author/Date</u>	<u>Translation (c) Cost</u>	<u>Submitted to NRC</u>
1. GKSS 7301 AR B 19 Draft - "Test Program for Basic & Plant Oriented Pressure Suppression Tests on the PSS Test Stand of the GKSS"	E. Aust, et al (March 1977)	--	--(b)
2. GKSS 73 03 AR B 25 "Supplement to 73 01 AR B 19"	E. Aust, et al (May 31, 1977)	--	--(b)
3. GKSS No. 73 03 AR B 40 "Druckabbauversuche auf dem PSS-Versuchsstand der GKSS..."	E. Aust (May 25, 1978)	\$239.85 ^(d)	July 18, 1979
4. GKSS No. 73 03 AR B 59 "Experimentelle Untersuchungen an Ein- und Mehrrohr-Anordnungen..."	E. Aust, H. Schwan, & J. Vollbrandt (Dec. 13, 1978)	\$174.72 ^(d)	July 18, 1979
5. GKSS No. 73 03 AR B 57 "Messsystem für das DAS-Mehrröhrversuchsprogramm"	J. Vollbrandt (Nov. 23, 1978)	\$676.65 ^(d)	July 18, 1979
5. GKSS 23 11 AR B 63 "Vorversuche zum DAS- Basisprogramm über Mehrröhr-Experimente"	E. Aust, H. Schwan (Jan. 26, 1979)	\$132.21 (120.00) ^(e)	August 14, 1979
7. GKSS 79/E/4 (non-proprietary) "Theoretische Untersuchung zum Freiblasvorgang der Kondensationsrohre im DAS"	E. Aust (Nov. 30, 1978)	\$487.50 (530.00) ^(e)	August 14, 1979

GKSS DOCUMENT SUMMARY

	<u>Title (a)</u>	<u>Author/Date</u>	<u>Translation (c) Cost</u>	<u>Submitted to NRC</u>
8.	GKSS 73 03 AR B 46 "Erste experimentelle Ergebnisse Zur Dampf- rondensation am Konden- sationsrohr mit Inschnurung"	E. Aust, et al (June 14, 1978)	\$ 87.25 (65.00) (e)	August 14, 1979
9.	GKSS 79/E/8 (non-proprietary) "GSSS-Basisprogram über experimentelle Untersuchungen an Ein- und Mehrrohranordnungen für Druckabbausystem von Kernkraft- anlagen"	E. Aust, Furst, & Niemann	\$310.05 (340.00) (e)	August 30, 1979
10.	GKSS 23 11 AR E1 "Ergebnisse der DAS-Experimente der GKSS VM 1"	E. Aust, et al	\$366.21 (340.00) (e)	August 30, 1979
11.	GKSS 23 11 AR E2 "Ergebnisse der DAS-Experimente der GKSS VM-2"	E. Aust, et al	(\$300.00) (e)	In Translation ¹ / ₄

Notes:

- (a) Except where noted otherwise, all documents are proprietary.
- (b) NRC - supplied translation.
- (c) Except where noted otherwise, translation cost is for text only.
- (d) Translation cost is for full document.
- (e) Translation cost estimated by LLL.

CONVERSION OF GKSS TV TAPES

The first GKSS pretest video tape was received on 7 August 1979. This tape included the following seven sequences, each consisting of black and white images with sound, on a 60 minute 3/4" Sony video cassette:

1. Pretest VM 1 under water
2. Pretest VM 2 under water
3. Pretest VM 3 under water
4. Pretest VM 1 above water
5. Pretest VM 2 above water
6. Pretest VM 3 above water
7. Pretest VM 3 above water

This tape was converted from the standard European 50 Hz/625 line PAL video format to U.S. standard 60 Hz/525 line NTSC format by Image Transforms Co. of Hollywood, Calif. The converted tape was received on 5 September and is currently being copied onto individual 15 or 30 minute cassettes as follows:

- Cassette A: sequences 1 and 4 (pretest VM 1)
- Cassette B: sequences 2 and 5 (pretest VM 2)
- Cassette C: sequences 3, 6, and 7 (pretest VM 3)

The individual cassettes A, B, and C are being generated within the Laboratory. In all cases, as with the GKSS reports, this information is being treated as proprietary data. It is of interest to note in this regard that Image Transforms does video tape conversion for all three major U.S. television networks and therefore can be expected to have a high appreciation of the need to protect proprietary information.

GKSS DATA TAPES AND PROGRAM LISTINGS

The first shipment of actual data tapes was received on 21 August. This shipment included two magnetic tapes with MEA data from test VM 1, together with a third tape containing the program listings of PLOTPS and TRABCD, two data reduction routines used by GKSS for digitized data. These program listings

have been placed on-line within the LLL Octopus computer network and are currently being modified to run on the CDC 7600.

In addition, hardcopy listings of PLOTPS and TRABCD were provided together with similar listings of the computer routine BANDPS, which is used by GKSS to write transducer data to direct-access files. The two data tapes provided to us by GKSS are BANDPS output which, in turn, provides input to the data reduction routines PLOTPS and TRABCD. This data has not yet been placed online within OCTOPUS.

A copy of the tape containing the PLOTPS/TRABCD listings is currently being examined by Computations Department personnel to resolve discrepancies which are apparently a result of differences in the LLL and GKSS computer systems.

As with all other information submitted by GKSS, computer listings and data are being treated as proprietary.

REFERENCES

1. E.W. McCauley, U.S. NRC/LLL Liaison with the Federal Republic of Germany for the GKSS-PSS Steam Condensation Tests - Progress Report No. 1, Lawrence Livermore Laboratory, Livermore, CA, UCID in preparation, June 1979.
2. Letter from E. McCauley, to S. Fabric (USNRC-RSR), August 9, 1979 (TF79-31).