

Los Alamos

NATIONAL LABORATORY

Technology & Safety Assessment Division
TSA-10, Nuclear Systems Design & Analysis, MS K575
Los Alamos, New Mexico 87545
(505) 867-0914, FAX (505) 865-2897

Date: July 16, 1997
Refer to: TSA-10-97-371 (Revision 2)

Allen Notafrancesco
Accident Evaluation Branch
Mail Stop T-10K8
Office of Nuclear Regulatory Research
Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Allen:

Proposed Modified LANL/FzK Agreement on GASFLOW

Dr. Gerhard Heusener has requested a modification to the July 1993 letter agreement between Los Alamos National Laboratory (LANL) and Forschungszentrum Karlsruhe (FzK) [formerly known as Kernforschungszentrum Karlsruhe (KfK)], concerning the exchange of the GASFLOW computer code and related data. He requested that Siemens AG be allowed the commercial use of GASFLOW because of their financial support of the development and assessment of GASFLOW at FzK. With this letter we are seeking the concurrence of the Nuclear Regulatory Commission (NRC) in certain modifications to the "GASFLOW Technical Information Exchange Agreement." This letter replaces in full my original letter (TSA-10-97-202) on this issue dated March 10, 1997.

Background

In the past, the NRC supported the computer code HMS (Hydrogen Mixing Studies), and the Department of Energy (DOE) supported GASFLOW, a more general code built upon HMS. When FzK approached LANL about working together and exchanging the GASFLOW code for data, LANL sought support from both the DOE and NRC. At that time, the NRC chose not to be a party to such an agreement. However, LANL made sure the agreement conformed with the NRC agreements for code distribution and kept the NRC informed about the negotiations and final form of the agreement. Beginning in 1996, the NRC, LANL (acting for DOE), and FzK began a collaboration to create a single version of GASFLOW that contained all of the models developed by the three organizations and to use the new consolidated version for future development, assessment, and applications. Now that the NRC is supporting GASFLOW, we are asking that the NRC officially concur with modifications to the LANL/FzK "GASFLOW Technical Information Exchange Agreement."

The LANL/FzK agreement had the benefit of reviews and approvals by LANL and DOE legal staff. I was the one person who dealt with all of the parties involved in putting that agreement together. One stipulation of the agreement is that GASFLOW shall not be used by foreign entities for commercial purposes. This was not negotiable in 1993. Today, the situation is different, and DOE now has more latitude in this area.

The contributions of FzK to GASFLOW have been significant and valuable to both the NRC and the DOE and are expected to be so for the foreseeable future. Because of the special nature of the Siemens support to FzK for GASFLOW, Siemens should be allowed limited foreign commercial use of GASFLOW to perform safety studies for nuclear power plants that are designed by Siemens or that are based on the European Pressurized Reactor (EPR). This wording of the limitation was proposed by FzK and discussed with LANL and the NRC at the GASFLOW meeting at FzK in late April. The DOE is open to broader commercial use should the NRC so desire.

The LANL/FzK agreement was constructed on the basis that it simply provided for the exchange of data and did not obligate either organization to perform any work. An important issue is that no money would exchange hands. Within this framework, the DOE appears to be fairly open to the expansion of the commercial use of GASFLOW, as long as equivalent rights are accorded to US companies that might wish to use GASFLOW.

The LANL/FzK letter agreement has three annexes. The pertinent parts for this issue are found in Item 2 in the letter agreement and in Item 5 in Annex II. A legal cleanup issue involves Item 11 in Annex II, Item 7 in Annex III, and related phrases in Items 2 and 3 in the letter agreement. These items would be modified as discussed below.

The proposed modifications were reviewed by Paul Gottlieb, Assistant General Counsel for Technology Transfer and Intellectual Property, at DOE, and by Ray Wilson in the LANL legal counsel office. Paul sent a memorandum dated February 20, 1997 (see attached copy), to the DOE Albuquerque office stating that the DOE Office of Nuclear Energy (NE) desires to have the exception granted, that his office has no objection to the change, and that the views of the NRC should be obtained concerning the proposed change. Furthermore, Paul stated that the February 20 memorandum is still valid for the agreement attached to this letter.

Letter Agreement, Item 2

Item 2 of the letter agreement currently reads as follows:

“2. KfK shall not distribute the GASFLOW software (which includes source code and code documentation, together hereafter referred to as GASFLOW) to any third party other than the agencies of the German government, Gesellschaft für Reaktorsicherheit (GRS), or German contractors using GASFLOW only for German or U.S. government sponsored work in the areas of reactor or nuclear facility research and development. GASFLOW shall not be used in Germany for commercial purposes. To assure the protection of U.S. rights, each recipient of GASFLOW shall sign a GASFLOW Declaration (Annex II) before receiving GASFLOW, and each recipient shall return GASFLOW to KfK upon completing the tasks for which the recipient received GASFLOW.”

The wording would be changed to the following, as shown by the underlined words. The phrase “, and each recipient shall return GASFLOW to KfK upon completing the tasks for which the recipient received GASFLOW” at the end of the original would be removed to make it consistent with the proposed elimination of Annex II, Item 11, as discussed later in this letter. The modified agreement would be updated by replacing KfK with FzK to reflect the name change that took place since the agreement was signed.

2. Except as stated in the following paragraph. FzK shall not distribute the GASFLOW software (which includes source code and code documentation, together hereafter referred to as GASFLOW) to any third party other than the agencies of the German government, Gesellschaft für Reaktorsicherheit (GRS), or German contractors using GASFLOW only for German or U.S. government sponsored work in the areas of reactor or nuclear facility research and development. Except as stated in the following paragraph, GASFLOW shall not be used in Germany for commercial purposes. To assure the protection of U.S. rights, each recipient of GASFLOW shall sign a GASFLOW Declaration (Annex II) before receiving GASFLOW.

FzK may distribute GASFLOW to Siemens AG for its commercial purposes, which are limited to performing safety studies for nuclear power plants that are designed by Siemens or that are based on the European Pressurized Reactor (EPR). Siemens AG shall sign the special GASFLOW Declaration (Annex II.A) before receiving GASFLOW.

Letter Agreement, Item 3

Item 3 of the letter agreement currently reads as follows:

“3. LANL shall not distribute the experimental results provided by BMFT and FzK under this letter agreement to any third party other than the agencies of the United States government or U.S. contractors using the data only for U.S. or German government. Contractors to LANL or other U.S. governmental agencies may have access to the German data for U.S. and German government sponsored work in the areas of reactor or nuclear facility research and development. The data shall not be used in the U.S. for commercial purposes. To assure the protection of German rights, each recipient of the data shall sign a GASFLOW-Related Data Declaration (Annex III) before receiving the data, and each recipient shall return the data to LANL upon completing the tasks for which the recipient received the data.”

The phrase “, and each recipient shall return the data to LANL upon completing the tasks for which the recipient received the data” at the end of the original would be removed to make it consistent with the proposed elimination of Annex III, Item 7, as discussed later in this letter. The modified agreement would be updated by replacing KfK with FzK to reflect the name change that took place since the agreement was signed.

Annex II, Item 5

Item 5 in Annex II currently reads as follows:

5. ORGNAM will not use GASFLOW for commercial purposes.

Added would be a new Annex II.A that would be identical to Annex II, except that “Organization Name” would be replaced by “Siemens AG,” “ORGNAM” would be replaced everywhere by “Siemens”, and Item 5 would read as follows:

5. Siemens will not use GASFLOW for commercial purposes except for performing safety studies for nuclear power plants that are designed by Siemens or that are based on the European Pressurized Reactor (EPR).

Annex II, Item 11, and Annex III, Item 7

Item 11 in Annex II and Item 7 in Annex III currently read as follows:

11. ORGNAM will return all copies of GASFLOW to KfK upon completing the tasks for which it received GASFLOW.

7. ORGNAM will return all copies of the GASFLOW-related data to LANL upon completing the tasks for which it received the GASFLOW-related data.

These items would be deleted (also in the new ANNEX II.A). These items were similar to items in the NRC software agreements, which considered temporary distribution of software for use in specific projects. Our interest with GASFLOW and related data is in the indefinite use of the information by an authorized organization. The usefulness and value of data and software decreases with time, and it becomes difficult after many years to fulfill this obligation. These items create an unnecessary burden on all of the organizations involved.

The entire modified letter agreement and annexes are attached. Changes from the original agreement are designated by the use of underlining. On behalf of DOE and LANL, I am requesting that the NRC review the cover letter and modified agreement and send me their comments and suggestions. Once the NRC concurs with the documents, LANL will send them to FzK. Should the FzK request changes, we will ensure that both the DOE and NRC concur with the final agreement signed by LANL and FzK.

If you would like to discuss this issue further, please contact me by telephone at 505-665-2538 or by e-mail at georgen@lanl.gov.

Sincerely,

George Niederauer

gfn:slv

Enc. a/s

Cys: T. King, NRC MS T-10E37
C. Ader, NRC, MS T-10K8
P. Gottlieb, DOE-GC
J. Chafin, DOE-AL
J. Herczeg, DOE/NE-50
R. Moore, DOE/NE-50
R. Wilson, LC-BPL, MS D412
J. Ireland, TSA-DO, MS K575
A. Neuls, TSA-10, MS K575
CIC-10, MS A150
TSA-10 File

DRAFT
July 16, 1997 (Revised)

ATTACHMENT 1
Draft Modified Letter Agreement

Dr. Gerhard Heusener
Nuclear Safety Research Project
Kernforschungszentrum Karlsruhe
P.O. Box 3640
D-76021 Karlsruhe 1
Germany

Dear Dr. Heusener:

Attached please find the GASFLOW Technical Information Exchange Understanding, Annex I. The University of California, d/b/a Los Alamos National Laboratory (LANL) and Forchungszentrum Karlsruhe (FzK, formerly Kernforschungszentrum Karlsruhe (KfK)), are looking forward to continuing a productive technical exchange and collaboration.

1. FzK and LANL recognize that neither the United States (U.S.) government, any of its agencies, and LANL, nor the Bundesministerium für Forschung und Technologie (BMFT), any of its agencies, and FzK, make any warranty, expressed or implied, or assume any legal liability or responsibility for FzK's or LANL's use or any third party's use, or the results of such use, or of any information, product, or process included in or calculated by this code or with the transferred experimental data, or represent that such uses would not infringe privately-owned rights.
2. Except as stated in the following paragraph, FzK shall not distribute the GASFLOW software (which includes source code and code documentation, together hereafter referred to as GASFLOW) to any third party other than the agencies of the German government, Gesellschaft für Reaktorsicherheit (GRS), or German contractors using GASFLOW only for German or U.S. government sponsored work in the areas of reactor or nuclear facility research and development.

Except as stated in the following paragraph, GASFLOW shall not be used in Germany for commercial purposes. To assure the protection of U.S. rights, each recipient of GASFLOW shall sign a GASFLOW Declaration (Annex II) before receiving GASFLOW.

FzK may distribute GASFLOW to Siemens AG for its commercial purposes, which are limited to performing safety studies for nuclear power plants that are designed by Siemens or that are based on the European Pressurized Reactor (EPR). Siemens AG shall sign the special GASFLOW Declaration (Annex II.A) before receiving GASFLOW.

3. LANL shall not distribute the experimental results provided by BMFT and FzK under this letter agreement to any third party other than the agencies of the United States government or U.S. contractors using the data only for U.S. or German government. Contractors to LANL or other U.S. governmental agencies may have access to the German data for U.S. and German government sponsored work in the areas of reactor or nuclear facility research and development. The data shall not be used in the U.S. for commercial purposes. To assure the protection of German rights, each recipient of the data shall sign a GASFLOW-Related Data Declaration (Annex III) before receiving the data.

4. FzK shall notify the LANL of any reactor safety problem that may be uncovered through the use of the code.

5. If FzK discovers or becomes aware of errors in GASFLOW, FzK shall communicate these errors to the code developers at LANL.

6. FzK shall ensure that any improvements or modifications to GASFLOW by users in Germany shall be transmitted to LANL.

7. FzK and LANL recognize that the provisions of Annex I create no legal obligations or liabilities for either party. However, FzK and LANL acknowledge that their obligations as outlined in this letter are legally binding.

8. The Understanding will become effective on the first day of the month following the latest date of signature of approval by both LANL and FzK. It is expected the understanding shall continue for five years; however, the understanding shall be reviewed annually for changes of mutual benefit and for affects of funding and major program direction by LANL and FzK, and it may be canceled by either LANL or FzK with 6 months notice.

9. This Agreement supersedes and replaces the rights and obligations of the Parties set out in the prior Agreement of July 1993.

Sincerely,

Dr. Michael Henderson
Division Director

Technology and Safety Assessment Division

We hereby agree to conditions 1 through 9 contained in this letter in consideration for the transmittal of GASFLOW from LANL to FzK and the selected BMFT and FzK data from FzK to LANL.

For Los Alamos National Laboratory	For <u>Forschungszentrum</u> Karlsruhe GmbH
_____	_____
Signature	Signature
Date	Date

DRAFT July 16, 1997

Annex I
GASFLOW Technical Information Exchange Understanding

Los Alamos National Laboratory (LANL) and Forschungszentrum Karlsruhe GmbH (FzK) have expressed mutual interest in exchanging information concerning the LANL computer code GASFLOW and selected data from experiments funded by the Bundesministerium für Forschung und Technologie (BMFT) useful in validating the code and in cooperating in analyses related to the assessment of GASFLOW.

They have reached the following understanding for technical exchange and cooperation.

1. Technical Exchange

1.1 LANL gains access to selected BMFT-funded experimental data that are of interest for validating GASFLOW.

1.2 FzK gains access to GASFLOW.

2. Program Cooperation

2.1 LANL and FzK will join together in cooperating in thermal hydraulic research and development programs conducted by LANL and FzK. The general goals of the LANL-FzK effort will be threefold:

2.1.1 The first goal will be to develop new and improved models for GASFLOW, a state-of-the-art three-dimensional, time-dependent computer code to analyze accidents in confined structures.

2.1.2 The second goal will be to thoroughly test the code and verify it with relevant experimental data.

2.1.3 The third goal will be to perform analyses for non-reactor nuclear facilities and for nuclear reactor containments.

2.2 LANL and FzK will exchange information in the form of computer codes, technical reports, experimental data, correspondence, visits, joint meetings, and such other means as they agree.

2.3 There will be no exchange of money between LANL and FzK. Each party shall bear its own costs.

3. LANL Activities

3.1 LANL will develop a project plan for further development and assessment of GASFLOW, including interfaces with relevant experiments and transmit it to FzK. It will be coordinated with the plans provided by FzK for its GASFLOW assessment activities. The plan will be reviewed annually by LANL and FzK and will be revised as priorities for GASFLOW development and assessment change.

3.2 LANL will continue to develop new models and capabilities for GASFLOW. The code is being developed under LANL software quality assurance guidelines. At various times when the development of a useful new model or capability has been completed, LANL will freeze the version of the code and assess it. When testing is completed, the new version will be released to LANL analysts for general use. The versions of the code released during the period of this understanding will be delivered to FzK, along with all relevant documentation. LANL currently maintains only a Cray version of GASFLOW. If the code is converted to other computers, LANL will make those versions available to FzK, once the converted codes meet the conditions for released codes.

3.3 LANL will provide reasonable support for installing and maintaining GASFLOW on standard configuration of CRAY or another computer for which LANL has converted the code. Only the latest version of the code will be maintained.

3.4 LANL will provide access to GASFLOW on a LANL computer facility for a member of the FzK technical staff.

3.5 The LANL technical staff will provide direction, training, and other assistance to the FzK staff member at LANL as required to perform, in cooperation with the LANL staff, the necessary development, testing, and analyses tasks required to meet the code development and testing goals. In addition, LANL will provide the FzK staff member computer access time; workstation hardware; and office space, furnishings, and supplies.

3.6 LANL will share its unclassified GASFLOW analyses that are relevant to the joint LANL-FzK code assessment activities. Relevant analyses include, but are not limited to, those of PHDR and Battelle experiments for which FzK supplied data to LANL. For these assessments, LANL will supply FzK with GASFLOW code input data, output results, and relevant reports of the code improvements and analyses.

4. FzK Activities

4.1 FzK will develop a project plan for its assessment of GASFLOW, including interfaces with relevant experiments. The plan will be transmitted to LANL. The plan will be reviewed annually by FzK and LANL and will be revised as priorities for GASFLOW assessment change.

4.2 FzK will provide selected BMFT-funded experimental data from the intermediate-scale Battelle-Frankfurt Model Containment (BFMC) and the Heissdampf Reaktor (HDR) experimental facility that are related to the assessment of GASFLOW for large and small steam-line breaks and for hydrogen and aerosol behavior. FzK will provide the experimental data and final reports from the selected tests. LANL will not distribute the experimental data supplied by FzK outside the government agencies of the United States unless FzK agrees.

4.2.1 FzK will supply data for the following tests:

- ! HDR Tests E11.2 (already supplied to the USNRC)
- ! HDR Test E11.4, E11.5
- ! HDR Tests E12.2.2 and E12.3.3
- ! BFMC H-2 deflagration tests
HX12, HX14, HX23, HX30
- ! BFMC DEMONA tests

4.2.3 At each of the annual planning meetings FzK and LANL will discuss the progress and experience of GASFLOW validation with the data transferred to LANL. Depending on the progress and the plans and after approval by BMFT, FzK will provide further BMFT-funded experimental data, focusing on the needs for further assessment.

4.3 FzK will provide information from the following ongoing programs related to hydrogen detonation problems for further validation of GASFLOW:

4.3.1 Detonation experiments in the FzK hydrogen detonation tube (medium scale).

4.3.2 Experiments on hydrogen detonation in complex 3D structures (large scale tests in the RUT facility).

4.3.3 Analysis results from 3D numerical simulations of large scale detonations in containment structures.

4.4 FzK will send a member of its technical staff knowledgeable in some of the relevant experiments or in the application of large thermal-hydraulic computer codes to reactor safety analysis to LANL to obtain experience with the code testing, verification, and applications. The FzK staff member will perform assessment analyses on selected experimental facilities and also do analysis for a FzK-supplied containment design. The FzK staff member sent to LANL will be subject to LANL facility security and access restrictions. FzK will financially support its staff member during his assignment at LANL.

4.5 FzK will send a staff member to LANL as soon as practical after the understanding is signed

by both LANL and FzK. The first assignment will last a minimum of nine months. The next assignment will be decided within 3 months prior to the termination of the first assignment according to mutual needs. Additional assignments will be decided annually.

4.6 FzK will be responsible for installing and updating to the latest version of GASFLOW on their computer systems. FzK will supply LANL trouble reports when it encounters problems running the code and sufficient information to enable LANL staff to find and fix problems.

4.7 If other organizations in Germany express interest in using GASFLOW, FzK will organize a user's group for discussion of ongoing application work and will keep LANL informed about the user sites and the ongoing activities involving the application of GASFLOW.

4.8 FzK may modify GASFLOW and will label the modified source code and its output to uniquely identify it from released versions. FzK will send its changes to the code to LANL for consideration as part of future LANL released versions.

4.9 FzK will provide access to the LANL GASFLOW staff to tour the FzK experimental facilities, to observe hydrogen-related tests, and to discuss the hydrogen-related research and development work with FzK staff. LANL staff will be subject to FzK facility security and access restrictions.

4.10 The FzK technical staff will provide consultation and other assistance to the LANL staff members as required to understand and analyze the experiments in cooperation with the FzK staff; details will be agreed upon within the coordination of the work plans. In addition, FzK will provide the LANL staff member with computer access time; workstation hardware; and office space, furnishings, and supplies while on visits to FzK.

4.11 Following implementation of GASFLOW at FzK, FzK will continue assessment analyses on its own computer facilities and using its staff. FzK will share its assessment analyses of GASFLOW with LANL. FzK will supply LANL with GASFLOW input data, output results, and relevant reports written about the code assessments.

5. Mutual Activities

5.1 LANL and FzK will hold at least one technical exchange meeting annually. One meeting will also include the annual planning session, which will alternate between the LANL and FzK locations.

5.2 LANL and FzK may jointly or separately publish reports about the analyses and assessments performed by this understanding. Both organizations shall approve reports on common work before they are published. The publication of BMFT and FzK experimental data supplied by this understanding shall be approved by FzK unless the quoted information is already published.

	DRAFT July 16, 1997
--	------------------------