MINUTES OF MEETING

FLACS USER GROUP (FLUG)



Venue: Rome, Italy, hosted by GexCon/University of Roma
Meeting: 17 November 2010
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List of Participants:

Alexandre Lebas	BMT	UK
Johnathan Green	BMT	UK
Baptiste Géniaut	GDF SUEZ	France
Rannveig Niemi	Safetec	Norway
Olga Merete Wiggen	Safetec	Norway
Emma Taylor	MMI Engineering	UK
Jerome Taveau	IRSN	France
Chris Savvides	BP	UK
Jerome Hocquet	Technip	France
Ole Kristian Sommersel	Statoil	Norway
Eric de Carvalho	Total E & P Norge	Norway
Savio S.V. Vianna	DNV	UK
Djurra Siccama	Arcadis-Vectra	Netherlands
Fabrizio Podenzani	Eni	Italy
Luisa Giuliani	University of Roma	Italy
Mathias Toupin	Technip	France
Paul van Rossum	Arcadis-Vectra	Netherlands
Pierluigi Olmati	University of Roma	Italy
Parag Gupte	ExxonMobil	USA
Francesco Petrini	University of Roma	Italy
Vincent Tam	BP	UK
Filippo Gentili	University of Roma	Italy
Chiara Crosti	University of Roma	Italy

GexCon/Internal participants
Erik Aadland
Prankul Middha
Trygve Skjold
Olav Roald Hansen
Idar Storvik
Ole Jacob Taraldset
Tommy Lea
Helene Pedersen
Francesco Chille

(The FLUG meeting was preceded by an open industry seminar on Accident Investigations on 16 November where about 35 people attended)

FLUG meeting 17 November 2010

FLUG Chairman: Jérôme Taveau (IRSN)

Welcome to FLUG
Prankul Middha welcomed the participants to Rome and FLUG meeting on behalf of GexCon.

Welcome to FLUG and agenda for the meeting
The Chairman welcomed the participants to the meeting. The proposed agenda was adopted after some changes (as one presenter did not arrive) by the participants.

Minutes from the previous FLUG meeting
The chairman went through the minutes from the previous FLUG meeting that was hosted by GexCon in Bergen 5-6 May 2010. Some of the specific items that were raised were theory documentation, NORCESS R&D project, porcalc issue and terrain/wind modelling

Chris Savvides (BP) asked about the status of the FLACS User Manual. Trygve Skjold replied that the manual is constantly updated and published on the FLUG web site. There was a wish to have the possibility to update the built-in manual as soon as changes were published (automatic download, FLUG email, etc.). Ole Jacob said that this would be possible to implement, but at the moment could not tell how much work it would require. Jerôme Taveau wanted to to have an updated list of FLUG wishes with a priority (given by FLACS team) and the initial planned response date (which may be postponed if other things receive a higher priority) + a web page with FAQ and solutions. IRSN has a similar support system for softwares SYLVIA and ISIS, and details can be seen here: http://gforge.org/gf/project/as-help/. He would also like 1 email per month to all users to inform about new changes in FLUG website.

Vincent Tam commented that there should be a transparent overview of the FLUG wishes with information about what GexCon plans to do about them. Ole Jacob commented that he would present the FLUG wish list later in the meeting.

Update GexCon Software & international offices.
Erik Aadland (GexCon) gave a presentation concerning news from GexCon Software and international offices. He mentioned that the main tasks of the SW department included Support, Feedback to R&D regarding development, Sales, Training, FLUG, Seminars, etc. An announcement about the establishment of GexCon Australia was made. The CRM support system seems to be working very well and helps a lot in keeping track of cases. Savia Vianna (DNV) commented that the speed of responses was very good but the quality of the responses was not always up to the mark. The department has an objective of 20 FLACS-I courses next year but also to develop new course offerings (FLACS ++ course, WEB sessions, etc.). With reference to "FLACS courses" Vincent Tam (BP) commented that GexCon should state in their course material that the Q9 method is not used/approved(?) by BP. There may also be a FLUG meeting in Asia next year.

GexCon R&D.
Trygve Skjold (GexCon) presented plans and prospects for the R&D department. The project portfolio includes only working with FLACS in one way or the other (support, development and maintenance). External R&D projects includes the JIP – FLACS 2011 and beyond, NORCOWE (FLACS-Wind), CO2 PipeHaz and 2 PhD projects (on Flashing releases and Explosions). New software products under development include a new RunManager for enabling more efficient 3D QRA, FLACS-Fire and VR-Safety. However, a final decision about the availability and pricing of these products has not yet been made. A recent proposal has been done for further extension of the wind modelling with FLACS (KULING). Prospects that the R&D department sees include VR, Fire, Structural Response, 3D-QRA and GIS and NORCESS (decision will be made in December 2010).

FLACS-Maintenance

Ole Jacob presented 3 topics in connection with FLACS-Maintenance:

- porcalc issue and update (December 2010 was mentioned as a release date)

- FLUG wish list + voting
- new scenario menu

The first presentation was based on the problem that was described in the last FLUG meeting. This is a weakness/limitation in the porosity calculations, where artificial contributions to the modelled flame folding due to subgrid objects may occur in some situations. This problem has now been resolved, and an updated version of Porcalc will be released in due time, i.e. as soon as the improved model has been properly tested and validated. An upgraded version of the utility program co-file is also planned. It was shown that the porosity issue has a limited influence on the results of the validation studies and two randomly chosen probabilistic analysis studies. Further, the influence of the porosity issue should be negligible for dispersion simulations. Djurre Siccama asked whether there were any changes made in the FLACS solver. The answer is none. Vincent Tam commented that some more details about the "ruleset" for porosity calculations should be published. Savio Vianna asked about the possibility of disabling automatic porosity calculations. This can be done using the options in the runmanager. He also asked about the differences in surface and volume porosities. The volume porosity is set to 0 or 1 in each of the 64 divisions (in 3 directions) in a grid cell based on if an object is "there or not". Djurre would like to see a log file to report which porcalc model is used. This should be available in due course. Vincent Tam asked for more details about the interaction of porosity with turbulence.

The audience expressed some comments / questions / new wishes:

- porcalc issue: want to have a more detailed description (a technical note/report has been written, will be published to FLUG)
- wants to automatically stop simulations with large mass residuals combined with a dump/restart possibility
- wants to have DTDUMP and NDUMPS for cyclic generation of dump files
- wants to have the dump files contain everything needed (like PMAX, PIMP, etc.) to make the restart more useful
- wants to have the possibility that flacs automatically appends data to the rt-files when restarting, now these files are truncated
- to plot different time steps on same page in flowvis (already there: relative time step)
- runmanager does not remember settings (cs.setup, flacs-version, ...)
- wants to easily detect monitors inside solids
- wants more than 50 leaks
- wants more than 1000 monitor points / panels
- wants distance from orifice to shock as output from the jet program (talking to Francesco Chille in the break)
- is it possible to have leaks with different gas composition in the same simulation? no!
- in standard flacs only the mixture fraction can be varied: lean - rich (so it is possible to have both AIR and FUEL leaks)
- in flacs-inert on can additionally have inert leaks
- wants better control of the legend in flowvis plots
- does monitor regions (defined in cs.MON) snap to the grid? No

A voting was carried out (anonymously) where the FLUG members were asked to rank the wishes (from the last FLUG meeting) in order for GexCon to establish a prioritization of the work. Ole Jacob presented the results of the FLUG wish list voting. These results are given below. GexCon will work on the wishes according to the prioritization received from FLUG members..We may also consider to send a larger list out to the whole FLUG by email.

Votes	Description
7	Validation, use of inclined objects in FLACS
6	Results from a ventilation simulation as input to wind boundary condition in another simulation
4	Extended guidance, effective handling of large geometries and optimizing the numerical grid

3	Upgraded/extended theory manual for FLACS
3	Improvements/extensions related to pool model
3	Stop the simulation when a pressure wave reaches a certain position
2	Remove output data from the 3D output file (r3-file)
2	Extending the jet program to describe “blowdown” scenarios and different orifice sizes
2	Command-line tool that can create database from macros
1	Flame speed as easily available output parameter in FLACS
1	64 bit version of the complete FLACS program package
1	Specify DTPLOT as function of time
1	Read larger domain boundary condition on smaller domain.
1	More options to end FLACS runs (with event files, mass residual errors or other method)
1	Exercise/live demonstration -training for FLACS users related to FLUG meetings
1	Independent XY-scaling in Flowvis
0	Upgraded/extended version of cofile
0	Improved terrain representation wanted
0	Visualization of FLACS geometry and results in VRML
0	Include T (and possibly velocity, turbulent kinetic energy, etc.) in cs.CLOUD
0	Define gray scales + change I,J,K to X,Y,Z

Tommy presented the new scenario menu (live demo). This included new features (complete modernization) of the scenario menu that are expected to be available next summer (along with the next large FLACS release). The FLUG members were generally quite happy with the development so far.

FP7 proposal on "Improvised Explosive Device (IED) neutralization in urban/civil environment"
Luisa Giuiliani (Univ. Roma) presented a FP7 proposal on "Improvised Explosive Device (IED) neutralization in urban/civil environment". GexCon and University of Roma will join this proposal that will involve some simulation and possibly development work for FLACS.

User Presentations

Sávio Vianna (DNV) presented " Explosion Modelling in Highly Congested Area: Why peak pressure results are sometimes so high?" He commented that he has seen some overpressures values of the order of 20 barg or so. Olav Hansen commented that this is not unusual and can happen due to reflections and focusing in a corner. Pressures all the way up to 90 barg were seen in some HSE experiments.

He also showed some unexplainable differences between FLACS v9.0 and v9.1, he will send the required files to GexCon for investigation.

Jerôme Taveau (IRSN) presented a study on "Overpressure generated by tank explosions: a numerical study" using FLACS. He showed that tank explosions are very complex to simulate, depending on tank geometry, ignition source, tank filling rate, tank’s roof and shell strengths, roof specific mass, etc. FLACS gives smaller results for separation distances comparing to simple models. The future goal of this study would be to find experimental data to compare with FLACS simulations, in order to verify the accuracy of FLACS simulations.

Eric de Carvalho (Total) presented "Sub-sea gas blowout, a case study". He compared FLACS and KFX results showing the shape of the gas clouds were quite different and FLACS predicted longer separation distances. Olav Hansen commented that the cloud shape in FLACS seemed to be more consistent with observations in large scale LNG experiments.
Some wishes coming from this work include:

1. Creation of a significant amount of leak cells is a very repetitive and long task: possibility to automate this task? Automatation to get a distribution?
2. Possibility to create leaks, clouds of different compositions?

Another part of the presentation included pool simulations and comparison between CFD (FLACS and KFX) and Phast. Again, much longer separation distances were seen with FLACS. This issue needs to be investigated further. Some wishes coming from this work include:

1. Possibility to create non-circular pool (or a pool of general shape) in order to instantaneously fill a bund, trench, etc.
2. Possibility to create more than one liquid release
3. Possibility to fix the evaporation rate

Pierluigi Olmati (Univ. Roma) presented "Blast effects on structures" describing simulations using FLACS in a domestic building. He presented differences in the simulation results if domestic congestion is included vs. if it is not. A comment made was to include more realistic final porosity when internal structures collapsed.

FLUG Dinner
The FLUG dinner was organized the day before the formal FLUG meeting at the Grand Palatino restaurant in Rome. 25 people joined the dinner.

Formal issues and Next meeting
Prankul suggested date for the next meeting: 2nd week of May 2011 (to be held in Bergen). The meeting will be held on May 11-12.

AOB
None of the participants brought forward any additional issues.

End of meeting
The speakers and the participants were thanked for joining the FLUG meeting, and the meeting was closed.