



Venue: Aquafin, Dijkstraat 8, 2630 Aartselaar, Belgium

Present:

Johan Van Assel	Aquafin
Gunther Waterschoot	Aquafin
Neel Devroede	VMM-AWA
Susan Anderson	WSL
Adrian Harper	WSL
Rob Millington	WSL

Objective: The objective of the meeting is to discuss progress on the outstanding actions and to find possible solutions for the current simulation problems.

Circulation: OpenMI-Life participants

1. Welcome and Introduction

- 1.1. JVA welcomed everybody to the meeting. The purpose is to discuss progress on the outstanding actions and to find possible solutions for the current simulation problems.
- 1.2. JVA suggests to take the action list from the last meeting as a first guide for this meeting and to add new points as they come up in the discussions.

2. State of play and discussion of previous actions

- 2.1. No further investigation has been made into the (re)calibration of linked models. When the event of 04/08/2008 can be run, the results may provide new insights in how to approach this problem. For the moment however, this is not a high priority.
- 2.2. Experiences from the past weeks and months, where both Aquafin and VMM-AWA have been performing different tests simultaneously, have shown that there is a clear need for a model update protocol. JVA will take up the draft template that he had prepared last year, and will finalise it for use halfway the demonstration phase.
- 2.3. The new CS version now has a more complete representation of the treatment plant.
- 2.4. An event list for CS was made, based on simulations for the period 1967-2003. This list has been passed on to VMM-AWA to be integrated with their own event list for RS.
- 2.5. Remote linking will be available (to a certain extent) in a version of Pipistrelle around the beginning of next year. JVA brings up to additional points related to remote linking :
 - a) he had understood from Kris Cauwenberghs that VMM-AWA has plans to move their modelling environment from PC to server and wonders about possible consequences for linking. However, ND is not aware of a concrete timing of such move.

b) there was a problem in the past with IW not being able to handle OpenMI simulations when the masterdatabase is on a network drive. It is not clear if this is still a problem with the current version and with Pipistrelle. GWA will check this. AH will check if this is an implementation problem.

Action GWA, AH

The idea of organising an IT meeting with the other use case leaders has not been discussed further until now.

2.6. All flood boundaries were received from VMM-AWA and flood links were created for all nodes within these boundaries. No problems with the exchange of flood vlaues were identified anymore lately.

2.7. There are no plans from the side of the RS developers to separate PDM from the RS engine. There is a new hotstart option in RS, but SA still has to test whether this works correctly in OpenMI simulations. For the time being, it was decided to keep working with the existing procedure of including a full 100 yr PDM calculation with every hydraulic run.

Action SA

2.8. The grid tool and the data monitor have become more or less obsolete with the release of Pipistrelle. AH has a new version with him (0.6), which contains a few bug fixes. Another bug about fixing the trigger date will be fixed in a next version.

2.9. The content of the training sessions to be held during the week of the Scheldt workshop was discussed. The first day will be a starters course similar to the one in Aalst during the first year of the project, but using generic models rather than InfoWorks examples. The second day, which was renamed to Common Technical Meeting during the last OpenMI-Life Steering Committee meeting, will cover topics such as data operations, spatial linking, options for logging etc. Pipistrelle will also be demonstrated for the partners who have not yet used it.

2.10. There are no prospects for improvements in RS regarding model adaptations for OpenMI.

2.11. A tool and procedure for multi run generation will be available around Christmas. The idea is that this will be done using a script outside InfoWorks. The specifications of a specific (master) run will be duplicated for a number of events. One of the complicating factors is that the current episode definitions in RS cannot be exported.

2.12. Nothing has been tested yet on how continuous CS runs could be scheduled using a chain of stand alone and linked runs.

2.13. The problem of making the DWF timestep multiplier for CS available in OpenMI does not have a high priority, since no continuous runs in linked mode will be done. However, in future configurations (or when RS would be more stable in low flow conditions) it may become an important issue. AH will check if there is a fundamental problem involved.

Action AH

2.14. There are no prospects for adding a gauge timestep to RS.

3. Discussion of recent problems

3.1. SA that there are a few problems with initialisation that we were not completely aware of until now. The problem is twofold :

a) the OpenMI implementation of CS seems to ignore initialisation completely. This can be proved by the fact that the creation of an OpenMI file (which should include the initialisation phase) is almost instantaneous, compared to the long time it takes in RS (where the creation of the OMI file includes the full PDM calculation). The workaround to this problem is to have a standalone warmup simulation of about 1 hr in CS, with the initial conditions of RS as level boundary. The actual OpenMI simulation in CS will then start from the final state file of that warmup run .

b) a second problem is that in OpenMI the first exchanged value always seems to be a zero value. This is a bug, which unfortunately is not obvious to solve. This would mean that in the very beginning of the simulation there would be a sharp increase in exchanged levels from zero to the initial conditions of RS, which is likely to induce additional instability. The workaround for this problem is to have the startdate in RS at least one timestep earlier than in CS. The faulty zero value will then be exchanged at a moment when CS is not even running. Note that in principle both models should start at the same time, but in practice OpenMI seems to exchange zero values in such case rather than to crash. *Post meeting note* : in the log files, this period is logged as an error, however without affecting the rest of the simulation.

Apart from these issues, there is the fact that initial conditions in RS are not comparable with an initialisation state in CS and that therefore the RS model needs to balance its levels during the first hour or so of the simulation. These transient data could be dempened out by applying specific (still to be defined) data operations, but after some discussion it was concluded that this is not a priority, as it doesn't seem to cause a serious problem.

The scheme to be followed is thus :

- 1/ run CS from day "-1" 23:00 to day "0" 00:00 using RS initial conditions as boundary
- 2) run OpenMI composition of
 - CS from day "0" 00:00 to day "n" 00:00 using initial state from 1/
 - RS from day "-1" 23:00 to day "n" 00:00

Post meeting note : it was found that although the end dates of both simulations are the same, the trigger date should be set to day "n-1" 23:59 to avoid that the last timestep calculation could not be finished. This should be investigated further.

Action AH, SA

- 3.2. A second type of problem is that some initial RS levels in combination with some low CS crest levels are such that they would produce a continuous inflow to the system. Although inflows could be prevented by adding a flap valve to the outfall in CS, it is likely that in reality reverse flows do occur, only not on a continuous basis.

A possible solution to this problem would be to apply a kind of band filter, which would limit the exchange of a certain quantity to those timesteps where it exceeds a certain value. This seems to be an acceptable solution awaiting further development of low flow stability in RS. AH will take this as a priority new data operation

Action AH

- 3.3. The main problem with the stability of the model however seems to be concentrated around the big CSO structure Eenmeilaan/Abdijbeek. Apparently the complexity of the exchanges around this structure may be too complex for the (semi-)explicit exchange mechanism that the OpenMI is. Following approaches are suggested to try and resolve the problem :

a) apply a relaxation factor on the temporal extrapolation (standard OpenMI data operation)

b) duplicate part or the whole CSO construction in RS. If partly duplicated then a dummy link (and a linear data conversion) must be foreseen in CS to allow the continuing river flow in RS to be subtracted from the exchanged flow from RS.

c) dempen the acceleration (gradients) on the exchanged quantities, using a still to be defined data operation.

Action GWA, ND

New data operations will be delivered with a temporary development version of Pipistrelle. No new version of IW will be necessary, but a few dll's will have to be copied into the existing IW and some changes will have to be made in text files.

Action AH

3.4. In the northern area of the model, there is a tributary of the Dijle which is not modelled explicitly in RS, but only as a PDM boundary. In CS, it is represented as a branch of culverted and open sections to allow the interaction with the sewer system to be correctly modelled before releasing the final flow into the Dijle in RS. JVA wonders if it would not be more correct to feed the PDM hydrograph into the upstream end of this tributary in CS and eliminate the direct release of it into the Dijle in the RS model. This would need PDM flows to be available as output exchange item of RS in OpenMI. AH will check the current implementation for this.

Action AH

3.5. Finally SA mentions a couple of smaller RS problems.

a) in RS run and sim IDs could get out of synchronisation. When this happens, it is better not to use those particular simulations.

b) lateral flows cannot be added to a zero length structure such as a bridge. In such cases, they have to be added to the next downstream section.

3.6. There was some confusion about the log files when using Pipistrelle. AH clarifies that, when Pipistrelle is used and the option to override standard SDK settings is ticked, Pipistrelle's composition run log file contains all the information that would otherwise go into the OpenMI log files. JVA suggests to rename the default name of the Pipistrelle log file so that there is no confusion anymore with the log files created by the OATC editor.

Action AH

4. Any other business

4.1. There were no other items.

5. Summary of Actions

5.1. The actions from the previous and current technical meeting are summarised below:

Section	Date of meeting	Action	Responsible	Status
3.2.1	31/07/07	Investigate problems of PDM (re)calibration for linked models	All	Ongoing
3.2.6	31/07/07	Run and evaluate linked model	GWA, ND	Ongoing
5.2	24/09/07	Elaborate on model update template	JVA	Ongoing
3.6	20/12/07	Improve model representation of treatment plant	JVA	Done
4.7	20/12/07	Elaborate event selection procedure in CS	JVA, GWA	Done
5.2	20/12/07	Meet with other use case leaders to organise IT meeting towards end 2008	JVA	Pending
3.3	01/02/08	Produce new configuration files from modified link numbers	GWA, ND	Done
3.4	01/02/08	Provide boundaries for flood zones outside Voer submodel	ND	Done
4.1	01/02/08	Check surcharge in open channels and modify where necessary	GWA	Done
4.3	01/02/08	Force Voer submodel to generate floods and test flood exchange mechanism	ND, GWA	Done
2.1	20/05/2008	Send copy of latest version of CS model to SA	GWA	Ongoing
2.2	20/05/2008	Finish RS models and send copy to SA and GWA	ND	Ongoing
2.2	20/05/2008	Try out different options for flood linking	GWA, ND	Done
3.3	20/05/2008	Investigate faulty exchange of flow and depth	SA	Done
3.4	20/05/2008	Discuss separation of PDM from RS engine	RM	Done
3.5	20/05/2008	Check compatibility of grid tool between 8.5 and 9.0	AH	Not needed anymore
3.5	20/05/2008	Send latest version of data monitor	AH	Not needed anymore
4.1	20/05/2008	Discuss content of second training sessions	JVA, RM	Done
4.2	20/05/2008	Discuss possible improvements to RS with regard to model adaptations	RM	Done
4.3	20/05/2008	Elaborate on multi-run procedure	RM, AH	Ongoing
4.3	20/05/2008	Try out minimal CS/RS configuration for continuous runs	JVA, GWA	Pending
4.3	20/05/2008	Investigate status of DWF timestep multiplier	AH	Ongoing
4.3	20/05/2008	Investigate possibility of gauge timestep in RS	RM	Done
2.5	06/11/2008	Check if masterdatabases on network drives still cause problems	GWA	
2.5	06/11/2008	Check if there is an implementation issue with network drives	AH	
2.7	06/11/2008	Check correct working of new RS hotstart option in OpenMI	SA	
3.1	06/11/2008	Investigate why last timestep cannot be finished properly	AH, SA	
3.2	06/11/2008	Develop new data operation for band filtering	AH	
3.3	06/11/2008	Try out different options for model stability	GWA, ND	
3.3	06/11/2008	Send new version of Pipistrelle with additional data operations	AH	

3.4	06/11/2008	Check if PDM flows can be made available for exchange	AH	
3.6	06/11/2008	Change default log file name in Pipistrelle	AH	

6. Date of next meeting

There is no date yet for the next meeting. Further discussions will presumably take place at or shortly after the Scheldt workshop.

Johan Van Assel – Coordinator use case A