

## Monthly Meeting (September, 2020)

Date: September 29, 2020

Time: 2:20 pm - 3:20 pm

Location: Park Seismic Office

Attendees:

In the office: Choon Park and Jin Park

Via Skype: Josefin Starkhammar and Nils Ryden

Greetings: talking about autumn foliage in New England and Sweden.

### Topics regarding Administrative work (All)

1. Jin asked Josefin to prepare a detailed invoice just like the one prepared in March to purchase the PXI system as soon as she comes up with a plan to purchase next hardware components.
2. Jin mentioned that she would expect to receive the invoice package for the month of September within the next two weeks.
3. At the end of the meeting, Jin asked the Team Sweden if their pace of working has been normal because so far they used only 20% of total budget time that is significantly lower than the average rate at this time of the project period (~40%). If so, then there will be a significant amount of unused budget at the end. Josefin and Nils replied they will use a lot more times in the coming months and therefore the budget underuse will not happen.

### Topics regarding Technical work

#### 1. The 1st Joint Field Test (1st JFT)

- Choon mentioned that we would execute the first Joint Field Test (JFT) scheduled in the 4th quarter of this year (October - December). Although it was scheduled during the 4th quarter, Choon mentioned he always thought it would be during October because everything in Lund, Sweden, would get bitterly cold and be covered with snow at the later time of the year. Josefin and Nils replied that it would not be that cold at Lund, which is located at the southern end of the country. They also mentioned that it would rain rather than snow during the winter. So, all agreed that it (JFT) can take place anytime during the 4th quarter.
- Choon then proposed it should take place either in November or early December because we don't have our 1D system ready yet and it will take at least 1 month for Josefin to build it once we agree on the specifications, which we have to come up with during today's meeting. Choon preferred November to leave one more month for post-test tune-up purposes. Choon asked Nils if Team Sweden is ready to propose the final configuration.

## 2. Finalization of Configuration for 1D System

- Nils replied they recently have been out several times, tested the old system with new impact sources, and collected a lot more data. He mentioned that they are planning to go out again with improved sources and collect more data with better quality that can help the final decision.
- Choon replied that we already have enough "good" data that can be used to make the decision and we should not spend further time for that. Choon urged all to make the decision now. He then made a short presentation to illustrate that the 16-channel array with three times ( $3dx=2.25$  cm) the existing microphone spacing ( $dx=0.75$  cm) can achieve almost 100% quality achieved by the full 48-channel array. He stressed that it was the same observation for all data sets collected so far. Then, he proposed this configuration should be the way we have to move forward for the 1D system.
- Nils mentioned that he was thinking of other approaches such as collecting a data set for an entire section of the road as much successfully as possible without any issues. Then, he would make the decision only after that.
- Choon emphasized that the other issues are something we have to keep working on along the way, but they are not related to the finalization of the configuration for 1D array. He stressed again that we have move forward to come up with 1D system by now so that we can perform the JFT in the early future.
- Choon also mentioned that the recent "freezing and lag" issues in the acquisition system after collecting a certain number of records (e.g.,  $> 100$ ) may happen with our new system at an even worse extent because of the more channels being used (64 channels rather than 48 channels).
- Josefin replied that the new system is a faster one so that the issues, if exist, will not be as much severe as with the old system. But, she also mentioned that even with the new system there will be unavoidable limitations because of the streaming that is impacted by the data size for a given time. She mentioned that the new system uses the PXI express bus, which is ten times faster than the old system in read/write speed. In that sense, the issue will be mild if exists or it may not exist.
- Choon mentioned his experience with the freelancer who was hired to provide the C++ TDMS module that he was knowledgeable in PXI system. So, if Josefin has any issues or obstacles during the hardware build in the future, then we can contact the freelancer for any possible consultation.
- Josefin and Nils replied that so far they did not encounter such situations yet. Josefin mentioned that it would be difficult for someone else to help unless it owns exactly the same hardware system. She talked about her recent experience with the NI support team that took such a long time until the issue was solved because the team did not refer to the same hardware system.
- Choon proposed the freelancer as our "backup" whenever we need. Everyone agreed. Josefin and Nils mentioned that they do not have any problems that may warrant the help yet.

- Choon asked Nils again if he needs more time to make the decision. Nils replied that the 16-channel option seems quite promising, but there are other topics we have to consider such as spacing and analog filter specifications.
- Choon asked Josefin how long it will take to build the 1D system once all specifications are finalized. Josefin replied it will depend on other factors such as situations with her other jobs like teaching at the university. She replied that we still have one more year to go.
- Jin replied that we don't have much time because we have to execute the JFT during the 4th quarter. Choon replied that the JFT itself will take more time than we may think because of many unexpected issues arising during the test. He urged again everyone to move forward by making the decision now.
- Nils asked Choon for the optimum receiver spacing and Choon replied that the 3dx is the most optimum configuration for the 1D array. Choon mentioned that this conclusion was based on test results with all field records Nils provided so far.
- Nils replied that then we have to go for it (3dx). He also mentioned we have to finalize the analog filter specifications. Choon replied that current specifications have been good enough for him. Nils mentioned that most recent high-pass filter was set to 5 kHz that turned out much better than previous setting of 3 kHz. But, it (5 kHz) still gives the false trigger when the source is dragging and therefore generating strong low-frequency noise. In this sense, he proposed even higher high-pass filter to avoid such false triggering. Josefin mentioned that this project is not R&D project and we should not take any risk to modify the old configuration and therefore we better not change the analog filter specification. Choon mentioned that our project is neither pure R&D nor pure development project, but it falls in-between. He further mentioned that in that sense we have to make our own efforts so that we can maximize the effectiveness of the final product as much as possible.
- Choon proposed that Nils and he have another technical meeting on next Tuesday to talk more about those technical issues and finalize the specifications for the 1D system. Nils replied it is a good idea and agreed.
- Nils asked Choon how much low frequency we need as it is important to finalize the high-pass analog filter specifications. Choon replied current setting is good enough.
- Choon asked Josefin about how the laptop computer is working with the PXI system if it is necessary to log out to switch between laptop screen and PXI screen. Josefin replied that all you have to do is minimize the remote desktop window for PXI whenever you need to access the original laptop screen. It is a built-in option in the operating system that can be found by searching for remote desktop.

**Agreed to do:**

1. Choon and Nils will have a technical meeting at 2:15 pm (EST) on Tuesday, October 6.
2. The Team Sweden will finalize the configuration for 1D system as soon as possible.

The meeting adjourned at 3:20 pm.