Meeting Minutes

To: Mitjan Kalin (Coordinator)

From: Hamid Khanmohammadi

Date: 22 and 23 Nov 2018

Venue: NTNU, Trondheim, Norway

Subject: 6 months meeting

22 Nov **17:30-19:00**	- General discussion about project progress
23 Nov **8:00-9:00**	- Visiting NTNU labs: A tour in Corrosion and Tribology lab of NTNU, Discussing different corrosion measurement methods (including OCP, Potentiostatic EIS, Potentiodynamic Polarization and …), Visiting different tribomachines (rotating and reciprocating) working at different normal load ranges, different tribocorrosion machines, eQCM, AFM and IFM.
23 Nov **9:00-12:00**	**IPN** - They have some problems with the source of the coating machine and fixing this part may take by end of the year. - They have prepared and sent some HIPIMS coatings but the coatings suffer from lack of adhesion to the substrate. - They presented their characterization of WDLC based on SEM+EDS (thickness, elemental analysis, interlayer…), hardness (nano-indentation), and roughness (AFM). - IPN group proposed different methods to control the effect of high amount of W on the corrosion behavior: decreasing the amount of W, applying the Cr sub-layer as a gradient layer from substrate to the top, changing the alloying element from W to Ag

	- IPN group will be able to coat the samples of NTNU group by DC procedure and optimization of the HIPIMS will be pursued from the new year
	TINT - TINT have focused on glycerol as the base oil to study the tribotests. Two different temperatures were selected for study 50 C and 100 C. The lubricants were prepared by adding 1 wt% of four different ionic liquids (IM, PP, AM and BMP) to glycerol and sonicating with ultrasonic finger. - TINT data showed that Glycerol-1%BMP has poor friction decreasing behavior compared to three other ionic liquid mixtures. - TINT studies showed that ionic liquid additives were not active at low normal loads (2 and 5N). - TINT group is ready to start preparing their first paper based on the achieved data - TINT group is happy with the neutron reflectometry data and these data will be processed during next months
	NTNU - NTNU group have focused on two different group of lubricants: Water based lubricants, Poly-α-Olephine (PAO) base lubricants - Friction behavior of water-glycol based and PAO based lubricants by adding different amount (0.25, 0.5, 1, 2 and 4 wt%) of four ionic liquids (IM, PP, AM and BMP) on the surface of SS316L alloy is studied. - Corrosion behavior of WDLC coatings are studied in water based lubricants (containing 1 wt% of four different ionic liquids) - QCM study of film forming behavior of PAO based lubricants (containing 1 wt% of four different ionic liquids) is carried out - NTNU group will send table of their required coatings to IPN and they will receive DC coated samples by the end of the year

WP9 & WP10: Management and Dissemination Summary of agreed Actions	
23 Nov **13:00-14:30**	- Participants agreed the time of the next meeting in Ljobliana on next July - Publication agreement: Wahyu as a PhD student should publish his obligatory papers under the certain rules of NTNU, other papers will be written by the name of all group members as co-authors - TINT will send signed form from Tajfun company and NTNU from National Oilwell Verco to IPN - Participants agreed on holding up a GreenCOAT workshop during ECOTRIB 2019 on 12-14 June 2019 in Wien, Austria - All group agreed on more actively presence of research groups in the Cloud system. LinkedIn and ResearchGate are other media to present the highlights of the project