



Appendix (A)

AL MANARA WATER COMPANY Ltd

شركة المنارة للمياه المحدودة



08 August 2017

Subject – Evaluation of Portable Chemical Transfer System

To whom it may concern,

This confirms my attendance at the commissioning test of a portable chemical transfer system designed and constructed by Engineer Mohamed Elfatih as a part of his post graduate qualification program.

The objective of the portable chemical transfer system is to assist in the abstraction of chemical from 200 litre drums in which it is imported, and transfer of the chemical to site installed bulk storage tanks. In doing so, the portable transfer system reduces the labour required to manhandle an existing pumping system that has to be lifted and manually installed on each 200 litre drum, and it also reduces exposure risk of labour to the chemical being handled/transferred.

The portable transfer system is designed to be positioned adjacent to a 200 litre chemical drum and incorporates a rigid suction tube which is lowered into the drum by means of a motorised platform which can be set to accommodate different container sizes. The system utilises selectable duty/stand-by chemical transfer pumps for abstracting the chemical from the 200 litre drum and transferring it to the bulk storage tanks. A foot valve on the suction tube ensures that the pump is kept primed and a low level cut-out also prevents the pump from running dry. A manual override is incorporated into the controls to enable the pumps to be operated in the event of failure of the automated transfer sequence.

It is the writer's view that further developments and improvements would be necessary if it were the intention to go further than simply proving the operating principle, but in the commissioning test, the system operating principle was demonstrated satisfactorily by lowering the suction tube into an open container and initiating the transfer sequence. The transfer was successful and the operating principles were shown to perform the task satisfactorily.

Best Regards

John Phildius

AMWC Plant Manager



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Appendix (B)

Production department

Memorandum

25/07/2017@17:40

017-OP/0011

Subject: -Evaluation testimony

This is to confirm attending commission test carried out to evaluate the evaluation of the automated movable feeding pump system designed and executed by Engineer Mohamed Alfatih as part of the requirements of his post graduate qualification program(Master degree in engineering science).

The anticipated system was envisaged to minimize the physical effort made by labours on daily basis for filling tanks with chemicals these tanks used to feed dosing pumps so far the whole system depend on manually filling these tanks on timely manner, the chemicals imported in 200 litre drums and one HP pump used to pour the content of the drums into the tanks.

More over the height of the drum is 0.9 meter and the suction side of feeding pump is a rigid 1.2 m pipe accordingly the operator(s) shall lift the pump over 2 meter in order to put it on the right position and take it out in the same way which add difficulties to the procedure, on the other hand the envisaged machine composed of movable platform with reasonable tolerance enough to maintain getting feeding pump to the right position on top of the drum and allow smooth evacuation the system furnished with sensor to trigger starting or switching the pump off.

I observed that the system is primed to move up& down to the desired points without need for intervention so far the precision of the system is quite acceptable.

An element of reliability as well as flexibility is added to the system through having the ability to toggle between auto mode & manually one,

Following the experiment I can commit that the system had achieved its purposes' certainly it's an applicable tool potentially will improve productivity and minimize risk.

Best regards


Abdelhameed Elsir

Production Manager



Appendix (C)