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## **CERTIFICATE**

This is to certify that the report titled “**Study and Analysis of Underwater Wireless Communication Using MIMO System**” is a bonafide record of Major Project-II submitted by Vineet Somani (Roll no: 2K13/MOC/17) as the record of the work carried out by him under my guidance. The said work has not been submitted anywhere else for the award of any other degree or diploma.

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**Dr. Rajiv Kapoor**  
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## **DECLARATION**

I hereby declare that work presented in this report, titled “**Study and Analysis of Underwater Wireless Communication Using MIMO System**”, in partial fulfillment for the award of degree of M.Tech. in Microwave and Optical Communication Engineering, jointly run by Department of Electronics and Communication Engineering and Applied Physics, Delhi Technological University, Delhi is my own work carried out during December, 2014 - May, 2015 under the guidance of Dr. Rajiv Kapoor, Professor, Department of Electronics and Communication Engineering, Delhi Technological University, Delhi.

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## **ABSTRACT**

Now a day though wireless communication technology has turned out to be a part of regular human life, the idea of wireless UW communication system still seems to be fantastical. However, researchers have spent over ten years on structuring the mechanisms for UW wireless information transmission.

In the past decades, the most widely technique is used acoustic wireless communication for underwater wireless communication. Acoustic communication is use physical layer technology for UWCNs. It is use for long distance communication [1], [2], [3]. But it has many disadvantages, such as air bubbles in water and temperature gradients are effect on speed of transmission [4]. Acoustic wireless communication has poor performance in shallow water.

Underwater wireless communication is useful in pollution monitoring, disaster prevention, offshore exploration and other applications. Wireless communication is a part of our life but under water wireless communication is still a lucrative field. The environment of subsea is challenging for wireless communication because the medium in which waves are propagating is not air, it is propagating through different fractions of water having different densities. Magnetic induction (MI) is a technique which is not affected by multipath propagation, large propagation delays and fading. MI communication can be accomplished with small size coil. MI technique creates constant channel condition and This (MI) technique is very useful in reducing path loss. In this paper, we analysis path loss theoretically and numerically. We also analysis, how to change path loss with electrical conductivity in a day and a year.

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TABLE I

PARAMETER VALUES

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