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Sl. No.	Name of the Faculty Author	Title of the Paper	National/ International Conference	Name Of The Conference
1.	R. Ramya Swetha	Residual chlorine Analysis in water Distribution Networks with Intermittent and Continuous System of Water supply	International	ICASCM-2022
2.	KBVSR Subrahmanyam	Particle movement comparison using CSM and FEM	International	AIP Conf. Proc. 2418
3.	KBVSR Subrahmanyam	Intelligent detector: Detection of forest fires using LoRaWSN technology	International	AIP Conf. Proc. 2418

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Residual Chlorine Analysis in Water Distribution Networks with Intermittent and Continuous System of Water Supply

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Abstract. Awareness of free residual chlorine measures at various places of water distribution networks is prerequisite to understand the quality of water delivered to consumers. Throughout the water distribution networks, residual chlorine distribution is not uniform as it depends on chlorine decay rate, system of supply and position of nodes from source. Booster chlorination application in water distribution networks is suitable approach for maintaining uniform residual chlorine among nodes. EPANET-MATLAB-Toolkit is applied to obtain residual chlorine levels at various places of water distribution network systems. Continuous system of water supply is more beneficial than intermittent system of water supply for water distribution networks because of maintaining proper quality and pressure. For continuous and intermittent system of supply for water distribution network systems, to understand variations of residual chlorine among nodes and applied mass rate of chlorine at source and booster stations, two water distribution networks are considered. One is an illustration network and the other is an actual water distribution network. Analysis of residual chlorine for these two networks with two systems of water supply with booster chlorination helps for successful management of chlorine.

Keywords: System of water supply; Booster chlorination; Free residual Chlorine; Water distribution network

INTRODUCTION

Across the globe, drinking water services face the difficulty of maintaining acceptable water quality to the public of particular city or town of a country as substantial water quality deterioration can happen inside the water distribution network systems because of contamination. To reduce the production of pathogens, disinfection is the best practice [1]. Disinfectants like chlorine have the ability to kill pathogenic bacteria and can maintain residuals. While travelling chlorine in distribution system, it responds with bulk water and pipe wall [2] [3]. Choice of using chlorine for disinfection is useful in water purification process because it is low price and simple to practice. But its excessive use delivers unfavourable taste and smell. As chlorine is a powerful oxidizer it responds to vast range of chemicals present in water and forms carcinogenic by-products in particular like trihalomethanes [4] [5]. Water works authorities should pay attention to manage disinfection with chlorine to be in its permissible limits to protect consumers from diseases and hazardous by-products. Free residual chlorine (FRC) concentration at different places of water distribution network (WDN) can be taken into consideration to supervise the quality of water supplying to consumers. In accord with WHO, allowable limit for FRC is 0.2-0.5 mg/l [6].

As disinfection is the predominant treatment, considerable research has been done by analysts for the progression of models to understand chlorine decay in WDN [7]. First order decay model is predominant model comparatively than the other models for chlorine decay; in this model chlorine concentration is estimated to decay exponentially [8] [9]. Most of the Indian cities have water supply for few hours only in day because of lack of water sources and

Particle Movement Comparison Using CSM and FEM

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Abstract For finding out particle movement in a 3-phase GIB, several numerical methods are employed namely FDM, FEM, CSM and BEM in a system which is complex in nature. In this paper, peak movement in radial direction simulation is performed for particles of Al and Cu for field computation with CSM and FEM methods for 400KV, 600KV, 800KV and 1000KV class of voltage levels in a 3-ϕ GIB and are compared. For doing simulation, quick knowledge of particle dynamics is essential for peak radial and axial movements. A mathematical modelling was developed by considering forces on particle like drag, gravitational and electrostatic. In this paper, the total results are discussed in detail and presented .

Key words: Gas Insulated Bus duct (GIB), Gas Insulated Substation (GIS), Finite Difference Method (FDM), Finite Element Method (FEM), Charge Simulation method (CSM), Boundary Element Method (BEM)

INTRODUCTION

In the present world, popularity of Gas Insulated Substation (GIS) has been increased due to its inherently more advantages as against Air Insulated Substation (AIS). Looking towards the environmental conditions, GIS is the best choice as there is no dust & salt pollution. So, there is a need to opt for GIS. As per the survey, 30% failures are because of presence of conducting particles in GIB which are due to defects in manufacturing or transportation [1]. Generally, it is very simple to calculate electric field for a physical system. But for systems which are complex, the problem can be solved only by using numerical methods like FDM, FEM, CSM and BEM. The application of FEM is with the fields which are bounded while the CSM and the BEM is with unbounded fields. In FEM, we consider the part to be analysed in whole but in BEM we consider only the outer boundary of the domain [12].

Of all the other gases, SF_6 strength of dielectric is 2 to 3 times that of the air. As a result, there is a reduction in the clearances between phases and the ground. Because of good properties of dielectric and arc-quenching. SF6 gas has become popular and it is non-flammable, and colourless. It was found that about 70 to 80% of SF_6 gas produced is utilized for GIS only. For FEM applications, available software packages are ANSYS (Ansoft Corporation Inc.) and NISA (Engineering Mechanics Research Centre). On the other hand, for other methods namely CSM and BEM need programmes to be developed individually by the user for field computations. For these methods, computer software packages like coloumb 2D, 3D etc are available. Using FEM and CSM methods [10,11,13], in this work, particle movement radially was computed in a 3-Φ GIB.

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Intelligent Detector: Detection of Forest Fires Using LoRaWSN Technology

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Abstract. Forest Fires are a significant factor in modeling various ecosystems on earth. They naturally process the clearance of plant debris and dead trees, making way for the young vegetation to thrive. The severity and frequency of the fires being high, leads to uncontrollable and nearly unstoppable forest fires which results in pollution of air with harmful emissions affecting human health and affecting the ozone layer. The proposed system here comprises developing distributed wireless sensor networks over highly selective zones in the forest to collect data such as sensing the flames of the fire, temperature and humidity fluctuations, CO_2 percentage in air, for determining the possibility of fire outbreak or its detection if already it has caught fire. The data collected over the LoRa WAN technology send to the base control station where it is analyzed, and the officials can alert the concerned authorities and fire control station.

Keywords. Forest fires, Sensor networks, LoRa WAN technology.

INTRODUCTION

Fire is one of the panchatatvas. But it can also destroy everything caught in its midst in a wide and uncontrollable way. Fire can reduce an entire forest to a pile of ash and charred wood. Bandipur Forest fire, Australian bush-fires, Amazon forest fire, etc. and can be quoted as some examples of forest fires that caused havoc and ecological imbalance. Forest Fires are caused by Natural phenomena or Man-made (or human negligence). Natural Causes can be attributed to changes in temperature and humidity level due to Global Warming and abrupt Climate Change. A dry weather and lightning ignites a flame that spreads swiftly over a wide area. Man-made causes include Jhum Cultivation Culture (i.e., Clear the forest land and use it for agriculture), unregulated and illegalmining, and hunting of animals for their char meat etc.

Fires are a daily occurrence within the Amazon during the season, but nearly 73,000 fires were recorded betweenJanuary and August 2019, subsequently the following year also has an alarming statistics. This raised the alarm for the emergency address of the issue. In this modern era, technology has become more sophisticated, thus easing more remote works. The proposed system here is Integrating Wireless Sensor Network based on the LoRa module, which can be an alternative to detect fires within the forest areas.

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