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電力代輸輸配電規則與合約之研訂

The Study of T/D Regulations and Contracts for Power Wheeling

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摘　要

本研究係配合電業法修正完成第一階段電業轉型之綠能先行政策，為推動綠電自由購售所需之轉供與直供制度下代輸規則與合約及費率所進行之研究，本文首先提出說明我國電業環境之輸電與配電電力代輸規則與合約及相關費率，其次透過國際間代輸制度的比較分析，最後並探討再生能源代輸不同態樣之案例模擬，研究結果提供相關決策者參考使用。同時，本文亦提出現行轉直供規則之限制與未來可以精進改良發展之方向，以供未來制度滾動修正時研擬參考與後續研究。

Abstract

The aim of this study is to cope with the Green Energy First Policy and the regulations of direct-supply and power wheeling of renewable energies stipulated in the newly amended Electricity Act. The contents of this study include: (1)an introduction of the regulations related to transmission and distribution, (2)contracts and tariffs of power wheeling, (3)comparison and analysis of power wheeling services and regulations of foreign countries, (4)scenarios and simulation of renewable power wheeling. The results of this study may be used as a reference for government decision making and a basis for further study.

關鍵詞(Key Words)：代輸規則(Wheeling Regulation)、代輸合約(Wheeling Contract)、直供(Direct Supply)、電業法(The Electricity Act)、代輸費率(Wheeling Tariff)。

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回頁首

架空導線弛度-張力計算法之探討

The Study of Overhead Line Sag-Tension Calculation Methods

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摘 要

架空導線的弛度-張力計算法，依考量物理上不同的彈性、塑性伸長行為，進而發展出各種計算法，並可歸納為 3 大類，惟各種方法皆源自材料的基本物理特性，於推演過程中，將部分條件適度地予以忽略或簡化而產生。其中 LE 法(Linear Elastic Model, LE 法)為最簡化之弛度-張力計算法，亦為本公司廣泛使用，雖為最簡化，但仍自材料的應力-應變特性發展而來，充分認識後，俾有助於對其他計算法之理解。本篇推演 LE 法的數學模型，介紹導線各種伸長行為，將材料的基本物理觀念配合應力-應變圖形輔助說明。

Abstract

Overhead line sag-tension calculation needs to put physical properties such as the elasticity and plastic into consideration. And the calculation methods are generally divided into three categories. However, all methods are closely related to the physical properties of the materials. When modeling the physical properties of different materials, some conditions are ignored purposely to simplify the calculation. Among the others, LE method is the most simplified and widely applied sag-tension calculation approach by Taiwan Power Company (TPC). Although LE method is quite easy in calculation, it conforms with material stress-strain mechanics, and helps understanding the other calculation methods. This study aims to introduce the deriving of LE math model and apply stress-stain curve figures to describe conductors elongation physics.

關鍵詞(Key Words)：弛度-張力計算法(Sag-tension Calculation Methods)、LE 法(Linear Elongation Model)、SPE 法(Simplified Plastic Elongation Model)、EPE 法(Experimental Plastic Elongation Model)。

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回頁首

台電公司輸供電與配售電事業部轉型為輸配售電公司之規劃研究

Planning and Research on Transformation of Transmission System Division, Distribution & Service Division of Taiwan Power Company into an Electricity Transmission and Distribution (Retail) Enterprise

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摘　要

依據 106 年 1 月 26 日之頒布修正《電業法》，台電公司須於修法後 6 至 9 年間轉型為控股母公司，其下成立發電與輸配售電公司。其中，涉及人數占總員額約 55%之輸供電事業部、電力調度處與配售電事業部如何適切轉型為輸配售電公司，實為達成穩定供電及保障消費者權益之必要條件。本文擬先探討台電公司組織轉型所面臨課題，如依《電業法》規範下輸配售電公司所應具備之雛形或相關法定責任；其次，蒐集並參考英、美、日、新加坡等國電業轉型過程中可資借鏡案例，作為台電轉型為輸配售電公司規劃之參考依據。最後，本文以台電公司於 107 年 6 月 12 日「轉型控股公司之架構規劃」內部高層會議決議：「台電轉型為控股母子公司組織模式以事業群單位」為基礎，在符合政府法規、國營監理及確保員工權益前提下，提出台電輸配售電公司組織轉型規劃及其配套措施。

Abstract

According to the Electricity Act amended in January 2017, Taiwan Power Company (TPC) shall transform into a parent holding company and two subsidiaries, namely a generation company (the GenCo) and a grid company (the GridCo) within six to nine years. The GridCO will principally be composed of two business groups (輸供電及配售電事業) and the Department of System Operation(電力調度處), approximately accounting for 55% employees of TPC, thereby to make sure stable power supply and consumer right protection.

This study aims to examine the issues initiated by TPC transformation and the regulatory responsibilities of the GridCO stipulated in the Electricity Act, by referring to some foreign cases such as UK, USA, Japan, and Singapore. Once in a high level management conference, a resolution had been reached that the organization transformation of TPC and the gudelines to be proposed for the GridCo will be based on the current business group structure of TPC, in line with revelant regulations and state-owned enterprise governance structure, and most of all must not do harm to employee benefits.

關鍵詞 (Key Words)：電業法(Electricity Act)、組織轉型(Organizational Restructuring)、輸供電事業部(Transmission System Division)、電力調度處(Department of System Operations)、配售電事業部(Distribution & Service Division)、輸配售電公司(Electricity Transmission and Distribution (Retail) Enterprise)。

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好玩易懂的水能源教育桌遊遊戲-以桂山電廠為例

A Fun and Easy-to-Understand Tabletop Game for Water Energy Education－Taking Kueishan Power Plant as an Example

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摘　要

本研究為了解能源使用情形並激發珍惜能源的態度與行為，研發「源源不絕」桌遊遊戲進行水力能源教學。教學內容則包括：了解基本水循環概念，認識水力發電的設施與程序，知道輸送電到各種使用端的過程，以及節能的方法四大項目。透過玩排七熱身，以及結合遊戲圖版玩跳格子遊戲，針對六個梯次能源小博士營隊活動進行研究，以建立整體水能源的概念，以期使成果能有效讓進行能源教學的參考。

Abstract

This study aims to make understand the usages of energy and thereby stimulate right attitudes and behaviors to cherish energy. We applies a so-called "Sustainable Power" tabletop game to proceed hydropower teaching. The contents of our courses include: realizing the basic concepts of water cycle, knowing the facilities and procedures of hydropower, understanding the procedures of electricity transmission and distribution, and four major items of energy conservation. Through playing games such as Sevens, as a warm-up, and plate hopscotch, we make understand our six echelons Energy Little Doctor Camp attendees the fundamental concepts of hydropower. The results of this study expectedly will be served as a reference for effective energy teaching.

關鍵詞(Key Words)：能源(Energy)、桂山電廠(Kueishan Power Plant)、桌遊(Tabletop Game)、行動研究(Action Research)。

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從工業 4.0 國際發展探討台電供應鏈 4.0 的主軸策略

The Study of TPC Supply Chain 4.0 Spindle Strategies from the Perspective of International Development

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摘 要

本計畫為求符合台電關鍵性材料管理需求與前瞻性，藉由半導體與工業電腦之標竿企業分析供應鏈 4.0 對物流、採購及供應鏈管理的影響與實質優化，並撰寫供應鏈 4.0 管理模式研究報告。

以此研究報告為依據結合 IBLH(Integrated Business and Logistics Hub)之概念，開發適合台電供應鏈之管理平台；於供應鏈採購管理範疇中研究探討台電採購現況及策略，擬定標準作業流程並建構供應鏈採購管理平台；於供應鏈溯源管理範疇中研究探討台電溯源管理與維修作業現況，進而擬定相關的規劃要領與建構供應鏈溯源管理平台。

兩供應鏈管理平台是以 ID 編碼標籤之技術為基礎建設達到整體供應鏈的行動化、互聯化及智慧化，透過行動裝置掃描標籤即時做資訊收集、傳遞及存取應用。

總體而言，開發建置供應鏈採購管理平台、供應鏈溯源管理平台、ID 條碼標籤追蹤、行動化作業管理等技術為優化台電供應鏈體系之基礎建設並以此強化供應鏈資訊流串接與上下游廠商之連結關係。

Abstract

This study aims to analyze the impacts that supply chain 4.0 might have on the logistics, procurement and supply chain management of Taiwan Power Company (hereafter as Taipower), by referring to benchmarking enterprises of semiconductor and industrial personal computer, to be in line with the company's current and future needs for crucial material management.

By combining the results of this study and concepts of IBLH (Integrated Business and Logistics Hub), a supply chain management platform has been developed for Taipower. The contents of this study include: (1)exploring the current status and procurement strategies for Taipower, (2)formulating standard operation procedures (SOPs) and construct a supply chain procurement management platform for Taipower, (3)studying the current traceability and maintenance operation status of Taipower to formulate planning guidelines for constructing supply chain traceability management platform.

Two-Supply-Chain Management Platform applies label technology as the infrastructure to achieve mobility, interconnection and intelligence of supply chain； scan labels with mobile devices for instant information gathering, delivery and store.

In general, supply chain procurement management platform, supply chain traceability management platform, label tracking technology, mobility management and the like are infrastructures to optimize supply chain management and help strengthen the interconnection of supply chain information network.

關鍵詞(Key Words)：工業電腦(Procurement Management)、溯源管理(Traceability Management)、採購管理(Label Tracking Technology)、行動化作業管理(Mobility Management)、條碼標籤(Integrated Business and Logistics Hub, IBLH)。

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回頁首

核能一、二、三廠緊急應變計畫區內民眾防護措施分析及規劃

The Analysis and Planning of the Public Protective Measures within the Emergency Planning Zones of Nuclear Power Plants in Taiwan

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摘　要

民眾防護措施之分析及規劃內容包括：人口分布、輻射偵測計畫、民眾預警系統、民眾集結、疏散及收容之分析與規劃。人口分布是調查緊急應變計畫區內相關人口，以戶政人口與特殊人口等資料統計為主，作為民眾集結、疏散及收容根據。輻射偵測包含核能電廠運轉期、事故期與除役期，環境生態中所受的輻射劑量觀察與偵測站位置設置，分別陳述電廠於核子事故初、中、復原期各階段下之相關措施規劃，如輻射監測、偵測方式與輻射偵測路線等進行評估。預警系統著重於警報站建置、測試、涵蓋率調查；預警系統未涵蓋區域，以防救災訊息服務發送平台結合巡迴廣播路線及其他支援系統進行通知。民眾集結、疏散及收容分析與規劃係提供事故時疏散路線規劃，評估適當民眾集結點及收容所。

Abstract

There are four parts of the Analysis and Planning of the Public Protective Measures, namely (1)Population Distribution, (2)Radiation Monitoring Program, (3)Public Alert and Notification System, and (4)Analysis and Planning of Public Rendezvous, Evacuation and Sheltering. On the part of Population Distribution, it covers population investigation within the emergency planning zone (EPZ), mainly based on household and vulnerable groups statistics. The results of the investigation may be served as an analysis and planning base for public rendezvous, evacuation and sheltering. On the part of Radiation Monitoring, it includes environmental radiation measurement and monitoring station installations during operation, emergency response and decommissioning stages of nuclear power plants, and has detailed description of the radiation monitoring measures such as radiation monitoring assessment, monitoring methods and routes during early, intermediate and late phases of nuclear emergencies. On the part of Public Alert and Notification, it emphasizes the installation, testing and coverage surveys of warning systems in EPZ. For areas outside the coverage of warning systems, emergency management information cloud platform (EMIC), mobile broadcasting and other support systems will be applied to notify the public. On the part of Public Rendezvous, Evacuation and Sheltering, it provides the planning of evacuation routes during emergencies and applicability assessment of rendezvous points and reception centers.

關鍵詞(Key Words)：分析與規劃(Analysis and Planning)、緊急應變計畫區(Emergency Planning Zone)、民眾防護措施(Public Protective Measures)。

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回頁首

蘭嶼(低放)貯存場附近海域之水文及水質化學

Hydrology and Water Chemistry in the Nearby Waters of the Lanyu (Low-level) Storage Unit

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摘 要

行政院原子能委員會於蘭嶼設立低放射性待處理物料貯存場，以貯存核能發電廠運轉發電後，所產生之放射性待處理物料。這些放射性待處理物料在貯存期間，對附近海域環境造成何種影響，必須加以調查。結果顯示，海域之水溫主要受天候及季節性變化的影響。鹽度無季節性變化，反而是各站的變異較大，顯示陸源水對近岸海域的影響，其中漁人村的鹽度偏低，此乃陸源水大量流入海域所致。pH 及溶氧量都符合環保署 107 年 2 月 13 日所公佈「海域環境分類及海洋環境品質標準」所規範甲類(適用於一級水產用水、游泳)海域水體之標準。較高 pH 的測站，往往伴隨較高的溶氧量，顯示本海域有較旺盛的光合作用。各測站的營養鹽均較外海來得高，此乃近岸海水長期受到含有高量營養鹽陸源水流入之故。

Abstract

Radioactive wastes are by-products of nuclear power generation. Lanyu Island was chosen by Atomic Energy Council, Executive Yuan, as a site of Low-level Storage Unit to store radioactive wastes incidentally produced by the nuclear power plants in Taiwan. This study aims to investigate the influences of the radioactive wastes to the nearby coastal areas. The results of our investigation are summarized as follows: (1) nearby seawater temperatures are majorly affected by climates, (2) no seasonal salinity variations, but variability observed among stations due to land runoff (the fishing village has the lowest salinity), (3) pH and dissolved oxygen complies with the relevant regulations (「海域環境分類及海洋環境品質標準」) stipulated by the Environmental Protection Administration in 2018, and high pH values accompanied by high dissolved oxygen, suggesting exuberant photosynthesis, (4) nutrient concentration are higher than those of the open oceans due to land runoff.

關鍵詞(Key Words)：蘭嶼貯存場 (Lanyu Storage Unit)、低放貯存場 (Low-level Storage Unit)、環境變遷 (Environment Changes)、水文 (Hydrology)、水化學 (Water Chemistry)。

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