

BIM Powers for Safety Management Enhancement

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Company Background



CLP Power

- Electricity supply to over 80% of Hong Kong's population
- Safe and reliable power supply services

We build “**Green Substations**” and infrastructures as part of our transmission network development.

CLP Power Electricity Transmission Projects



Transformer Erection



Substation Projects



Cable Tunnel Projects

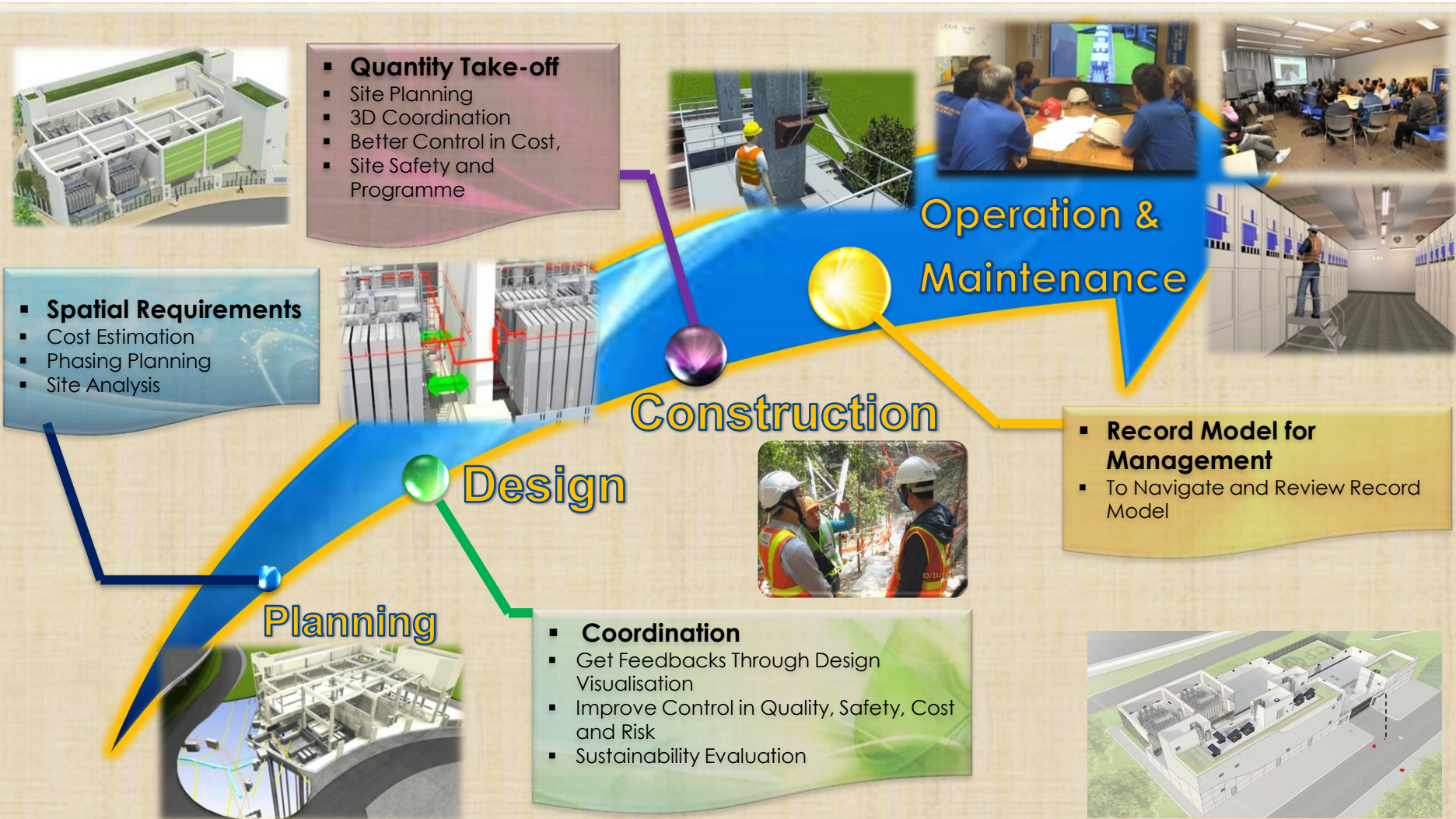


Overhead Line Projects



Submarine Cable Installation

BIM Application from Planning to Operation

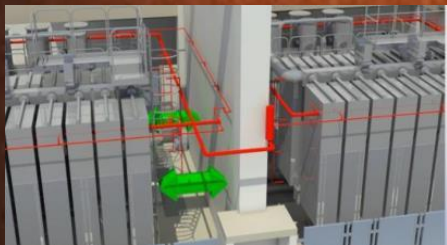


Extend BIM Application from Design to Safety Enhancement

Enhance Engineering Design

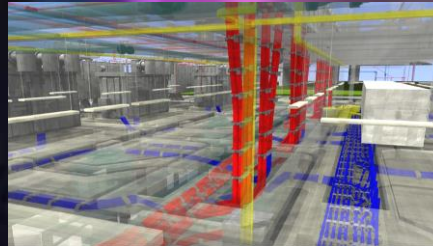


Lighting Layout inside Switchgear Room

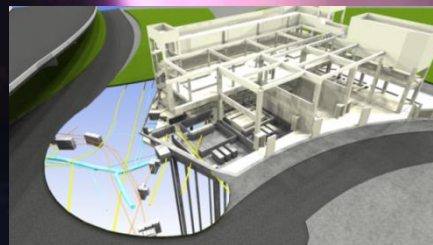


Space for Access inside a Congested Transformer Bay

Coordination of Building Works with Different Trades



Cables and Plants inside a Substation Building



Building Structure and Outdoor Utilities

Enhance Safety Planning and Implementation



Risk Evaluation before Commencement of Actual Site Work



Facilitate Discussion among Front-line Workers

BIM Applications in Safety Management

Design for safety



Safety planning
(job hazard analysis and pre-task planning)

BIM can help
improve workers'
safety and health



Site Safety Management



Safety training and
education

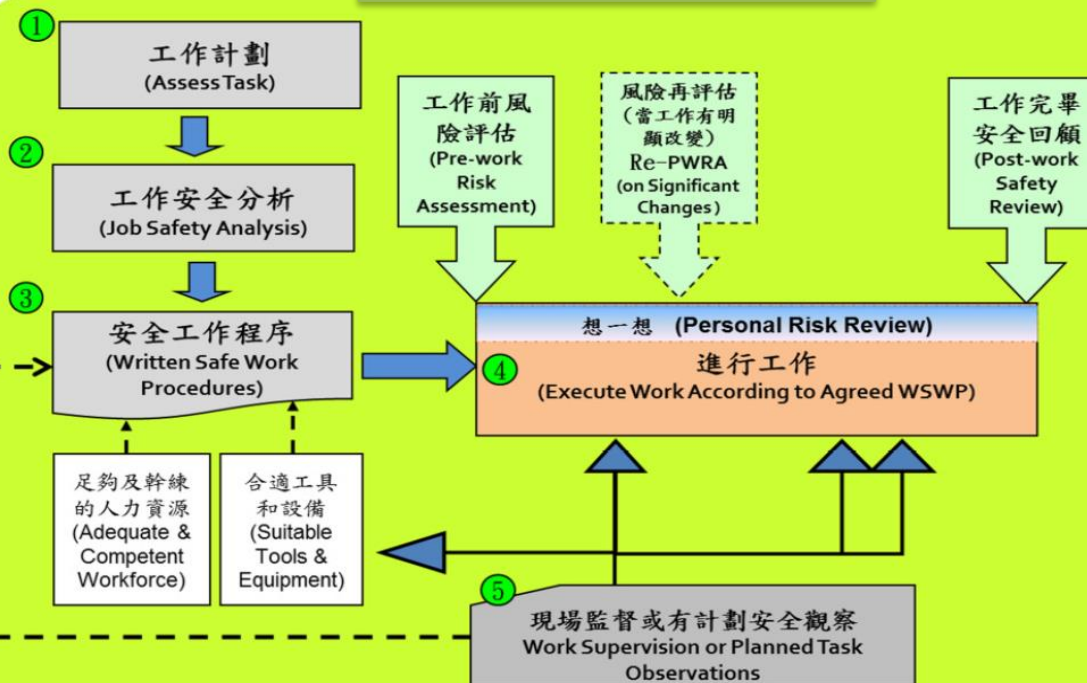


Development of Communication Format for Safety - DOCUMENT

Document



Safe Systems of Work



Development of Communication Format for Safety - GRAPHICS

Document



Cartoon



Photo



工作安全程序

主要工作步驟	相片(如適用)	注意事項
B. 控制措施	 <p>不要倚靠，吊桶應保持穩定與垂直，避免搖動。吊桶伸長少 600mm 距離。</p>  <p>完全打開懸臂，並以腳木支撐。</p>  <p>工作範圍必須良好照明。</p>  <p>吊臂有足夠空間伸展及移動。</p>	<ol style="list-style-type: none"> 吊桶應保持穩定與垂直，注意： <ul style="list-style-type: none"> 如吊桶旋轉時，應先停止吊桶，然後才進行移動。 如吊桶旋轉時，應先停止吊桶，然後才進行移動。 如吊桶旋轉時，應先停止吊桶，然後才進行移動。 把吊桶的伸長距離，先拉上鎖，防止吊桶旋轉。 吊桶應保持穩定與垂直，注意： <ul style="list-style-type: none"> 如吊桶旋轉時，應先停止吊桶，然後才進行移動。 如吊桶旋轉時，應先停止吊桶，然後才進行移動。 如吊桶旋轉時，應先停止吊桶，然後才進行移動。

標準工地作業

在工作高度於2米以下，須採用折疊式移動工作台。

例子



Development of Communication Format for Safety - VIDEO

Document



Cartoon



Photo

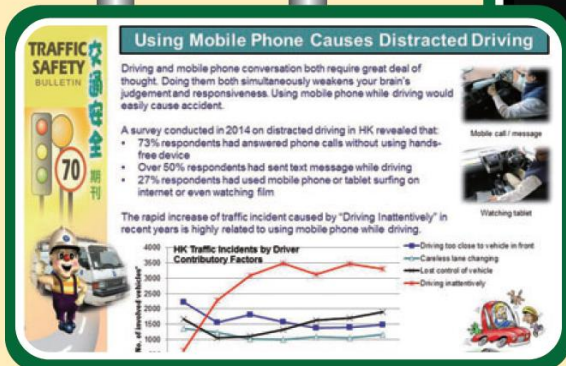


Video



Video

- Attract attention
- Comprehensive content
- Audio visual communication



Development of Communication Format for Safety - ANIMATION

Document



Cartoon



Photo



Video



Animation



Animation through Building Information Modeling (BIM):

- Information rich
- Physics
- Produce animation files easily

Merits of BIM on Safety Management

Physics

- Data rich digital information
- Spatial data: geometry
- Geographic information
- Time lapse
- Lighting level, sunlight glare, temperature, etc



Hot Zone of Truck Mounted Crane

CLP 中電

Scenarios

- Site specific with data
- Selected views from different perspectives
- Risk identification
- What-if analysis



Worker Engagement

- Visualisation, easy to understand
- Invite participation and comments
- Highly stimulating



General Process / Cost Saving of BIM in Enhancing Site Safety

5 Steps for BIM to Enhance the Construction Site Safety



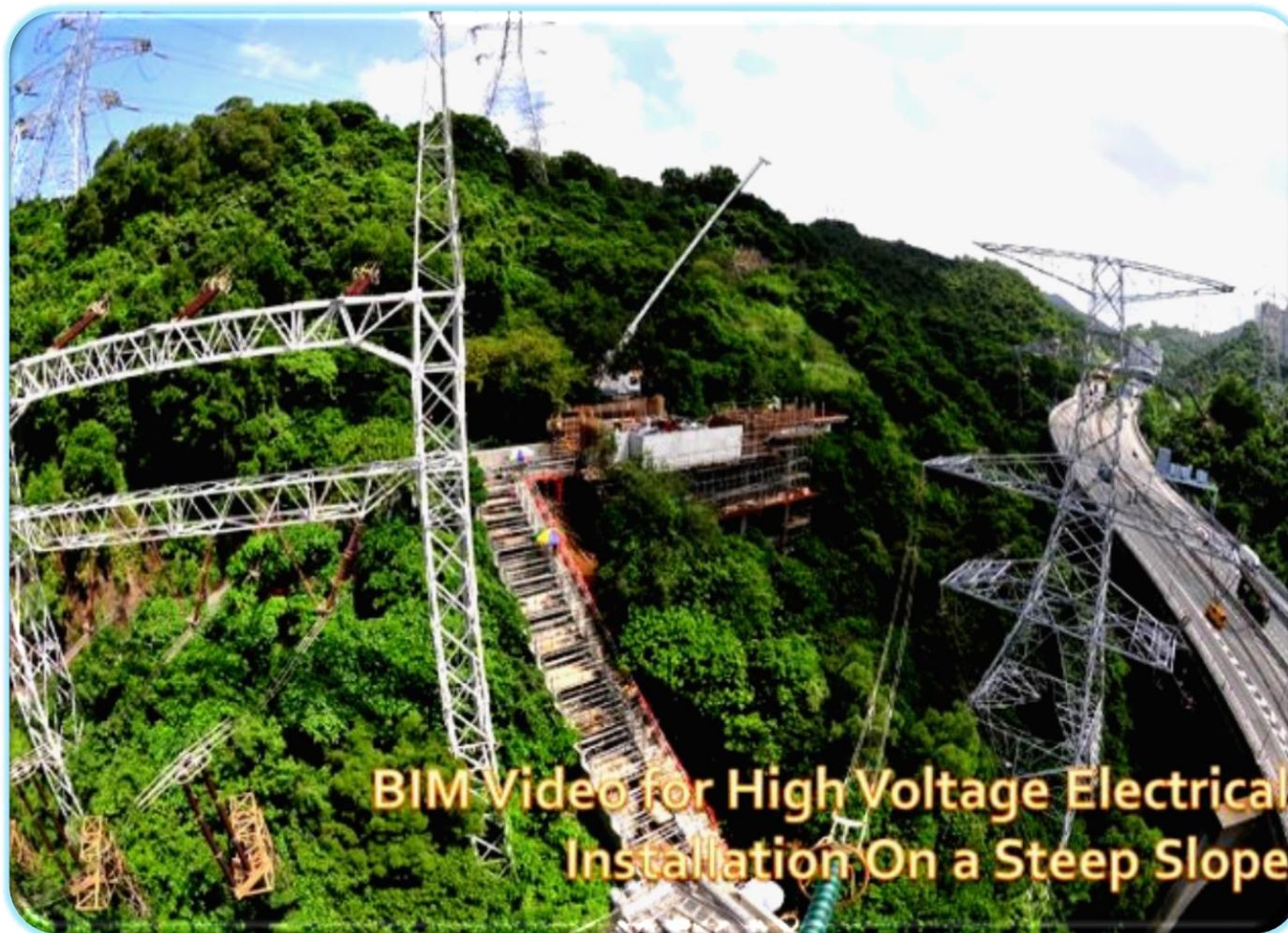
Overhead Cable Termination Structure On a Steep Slope



BIM simulate the site challenges on the steep slope before actual site work

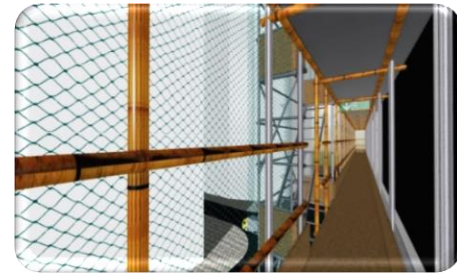


GIB Installation Works



BIM Enhances Planning for Safety and Emergency Action

Safety Enhancement Works at CLP Shatin Centre



Delivery of Transformer Unit to Underground Substation

TRANSPORTATION OF
TRANSFORMER TO BASEMENT

SBG 132kV TRANSFORMER ROOM

Slope Upgrading Works



Slope Upgrading Works for CLP Tower 4CPD1



Conclusion and Way Forward



- CLP Power has explored the opportunity of using animation to enhance the safety planning and execution in construction work.
- The 'fit for purpose' BIM process is proved to be cost effective and well accepted by the front-line workers.
- CLP Power would continue to explore the opportunity of BIM applications in delivering project objectives including safety, cost, efficiency, etc. :
 - To explore more BIM application in site safety enhancement
 - Sharing with other stakeholders to develop **safer**, **smarter** and **greener** practices for future projects



Safer ✓

Smarter ✓

Greener ✓

Thank you