Adopting the New Cable Colour Code
A Concerted Effort between the Trade and the Government

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Abstract: This paper highlights the collaboration between the trade and the Government in managing the change of cable colour to ensure the electrical safety of trade workers and the general public in Hong Kong throughout the change. With effect from 1 July 2007, cable colour code for fixed electrical installations in Hong Kong has been changed from red/yellow/blue/black to brown/black/grey/blue. The change ensures a steady supply of cable to Hong Kong, prevents possible cable price fluctuations and aligns with the latest international standards. As the change may introduce a risk to electrical workers and the general public, the electrical trade and the Government have worked together to minimize the risk associated with the change so as to ensure that the change is implemented safely and smoothly.

1. BACKGROUND

Since year 2002, major European countries including France, Germany and the United Kingdom (UK) have progressively adopted a harmonized set of new cable colour code (CCC) for fixed electrical installations [note 1] (i.e. brown/black/grey/blue table, see Table). The relevant national and international standards (such as IEC and BS standards) were also revised to suit. In Hong Kong, the trade and the government noted that the local red/yellow/blue/black cable colour code (see Table) for fixed electrical installations would no longer be in line with the relevant new national/international standards and the change might eventually have an impact on the cable supply to Hong Kong. It was imperative that we should find the way out.

Function of Cable	Colour		Letter Code
	Old Colour Code	New Colour Code	
Phase of single phase circuit	Red (or Yellow or White or Blue)	Brown	L
Phase 1 of 3-phase circuit	Red	Brown	L1
Phase 2 of 3-phase circuit	Yellow (or white)	Black	L2
Phase 3 of 3-phase circuit	Blue	Grey	L3
Neutral	Black	Blue	N
Protective conductor	Green-and-yellow	Green-and-yellow	--

Table – Old vs. New Cable Colour Code

Though the change in cable colour code is a rather straight forward technical matter, it has an impact to virtually anyone in the trade and has an implication to the public at large. Any decision to change, and not to change, has to be made prudently and timely. As for the implementation of the change, if any, it has to be handled carefully and in a phased manner. It must be fully justified and widely acceptable to the trade and the public. Associated risks should be properly contained with the minimum financial impact to the public. With such vision and objectives in mind, the Electrical and Mechanical Services Department (EMSD) set out to collaborate with the trade to face the upcoming challenges.

2. FORMATION OF A WORKING GROUP

With the endorsement of the Electrical Safety Advisory Committee (ESAC) [note 2], a "Working Group on the Review of Cable Color Code in Hong Kong" (Working Group) was established in 2003 among the trade and the industry to study the possible impacts of the change in cable colour code for fixed electrical installations and to make recommendations on the way forward. Members of the Working Group are from the utility companies, electrical trade unions, electrical contractors and consultant associations, academic institutions, cable suppliers, professional institutions, public bodies, government departments and the EMSD. Three Task Groups were set up under the Working Group, viz. the Technical Support Task Group, Training Task Group and Publicity Task Group, to study the technical and cable supply issues, training of electrical workers, and publicity and promotion issues respectively. The first two Task Groups were led by the trade while the last one was mainly coordinated by EMSD.

3. FINDINGS OF THE WORKING GROUP

Benefits of the Change

It has been the practice of Hong Kong, as an international metropolis, to adopt standards that are in line with relevant national/international standards. The Technical Support Task Group, which is chaired by the trade, prepared an evaluation paper on cable supply to assess the impact of cable colour change on the supply and price of electric cables in Hong Kong. The paper reported that over half of the electric cables used for fixed electrical installations in Hong Kong were imported from western countries where the new cable colour code had been implemented. Adoption of the new cable colour code for fixed electrical installations in Hong Kong could ensure a stable supply of electric cables, prevent possible cable price fluctuations, and avoid longer cable delivery time likely to be caused by the continued use of less commonly used cables. Such advantages would eventually benefit the trade and the industry as well as the general public.

Consultation with Stakeholders

After the detailed study, the Working Group recommended to ESAC in 2004 that the new cable colour code be adopted for fixed electrical installations in Hong Kong. The ESAC endorsed the recommendation in principle. A consultation exercise was subsequently carried out in 2005 among the electrical trade, construction industry, professional and learned institutes, utility companies, and relevant public bodies and government departments/bureaux. Comments received were forwarded to the Technical Support Task Group and Working Group for review. All stakeholders supported the proposed change to the new cable colour code.

Mitigation of Risk associated with the Change

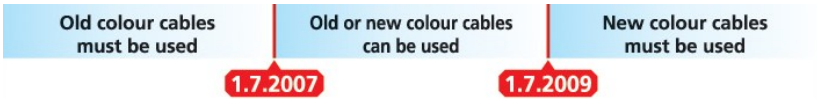
The adoption of new cable colour code would involve the change of black core from neutral to phase and the blue core from phase to neutral. Wrong connection of these cables may lead to short-circuiting and electrical accidents, in particular for extension, alteration or repairing works on existing installations involving both old and new colour cables. To assess the risk associated with the change, the Technical Support Task Group further conducted an in-depth risk assessment and recommended associated risk mitigation measures in 2005.

4. IMPLEMENTATION DETAILS

To take forward the change in a safe and smooth manner, a unified guidelines is needed for all trade members to follow, and they have to be trained for such guidelines. Trade members include not only the registered electrical workers, but also the allied trade workers in the construction industry, and those would-be electricians taking relevant courses in academic institutes. Also adequate time has to be allowed for training, and for new projects of various scales to ride through the transition smoothly. A series of publicity targeted at the trade and the public is needed.

Implementation Schedule

The implementation plan of the new cable colour code for fixed electrical installations drawn up by the Working Group was endorsed by ESAC in 2005. With effect from 1 July 2007, the new cable colour code can be used for fixed electrical installations in Hong Kong. To ensure a smooth transition to the new cable colour code, a two-year grace period (from 1 July 2007 to 30 June 2009) is allowed, during which electric cables of either the new or the old colour code can be used. For installations with on-site works commencing on or after 1 July 2009, only cables of the new colour code can be used.



Installation Guidelines

Having carefully assessed the risk associated with the change, the Technical Support Task Group devised and the Working Group endorsed the unified installation guidelines to provide clear and comprehensive safety practices for the trade to follow, thereby ensuring electrical safety. Noting that similar changes had been smoothly implemented in the UK, the Working Group made references to its practices in devising the local installation guidelines. The local guidelines promulgate minimum safety requirements and were finalized after thorough study and discussion among the trade, the Task Groups and Working Group. The set of installation guidelines was first issued to all Registered Electrical Workers (REWs) and Registered Electrical Contractors (RECs) in April 2006 and was subsequently incorporated into the local Code of Practice for the Electricity (Wiring) Regulations (published under the Electricity Ordinance, Cap. 406) in the form of an Addendum in March 2007.

Training for Trade Workers

The Training Task Group, which is also chaired by the trade, formulated a training plan for electricians in mid-2005. It includes the training time table, training strategy, training materials, training arrangements for REWs and other practitioners, etc. in order to equip electrical workers with necessary knowledge on the new cable colour code. This ensures the safety of both the electricians and the public. Working Group members further agreed that electrical workers should have basic knowledge on the new cable colour code before registration (for new, renewal or change of grade) as REW. The proposal was endorsed by ESAC so that from 1 January 2007 onwards, when an application for registration as a REW is received, EMSD will check the cable colour code training record of the applicant before processing his/her application.

A series of training courses has been arranged jointly by the trade and EMSD for electrical workers since 2005 prior to the implementation of cable colour change. Basically, there are five types of training, namely, mass-scale training sessions, train-the-trainer workshops, distributed training classes, web-based self-learning training and training

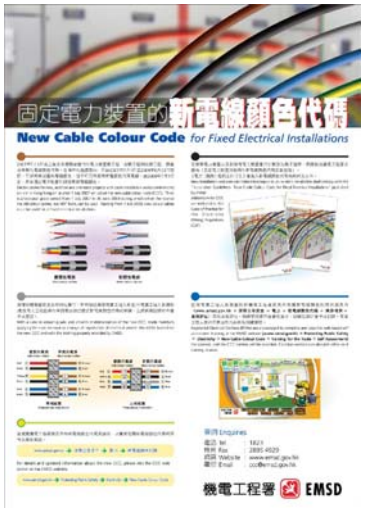
provided at the CCC Training Centre located at the EMSD Headquarters.

Mass-scale training sessions (usually conducted in the evenings) provide an interactive platform for electrical workers to discuss practical issues in relation to the change. Train-the-trainer workshops are conducted by recognized trainers and are most suited to large companies and organizations. As for the web-based self-learning training, a dedicated CCC web corner was established in EMSD's website (www.emsd.gov.hk) in August 2006 to provide self-learning training materials and an online self-assessment exercise for REWs to complete their training conveniently at any time and at any place. The CCC Training Centre, located at the EMSD Headquarters, commenced operation in January 2007 to provide video-based and computer-based CCC training to trade members, especially for walk-in REW applicants to timely complete their training before submitting registration applications. Appointment booking service is also available to facilitate trade members to use such training facilities and submit REW registration applications.

Since August 2006 when the local CCC website was established, 36,000 REWs (63% of the total REWs already completed the CCC training) have successfully completed the self-assessment through the web up to December 2007. There were altogether 471,000 hits on the CCC website in the same period, which is 6.8 times the total number of REWs in Hong Kong. It has now become the most visited webpage in the EMSD website, from both trade members and the public, as well as from overseas visitors. This channel has assisted greatly in distributing unified and timely information to all stakeholders, and has relieved us from a very substantial volume of workload in answering public enquiries.

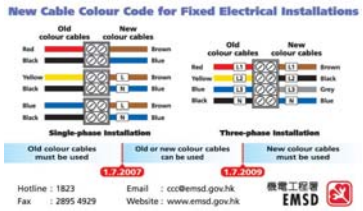
Publicity for the Trade and Public

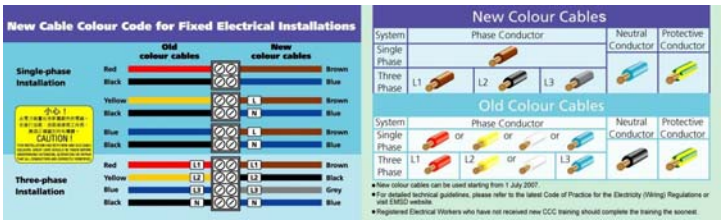
The Publicity Task Group, which is chaired by EMSD, devised a publicity plan for the trade, industry and the public to facilitate the cable colour change. Since 2005, a multi-pronged publicity and promotional programme for the adoption of the new cable colour code have been launched, targeting at both the trade as well as the general public.



Trade workers are advised of the development at an early stage since year 2003 when the Working Group was just established. The issue was kept open and transparent to the trade. They were informed about the latest implementation progress through multiple ways such as dedicated coverage in the EMSD newsletter "Electricity News" (which is distributed free of charge to all REW/REC on half-yearly basis), trade publications, trade seminars,

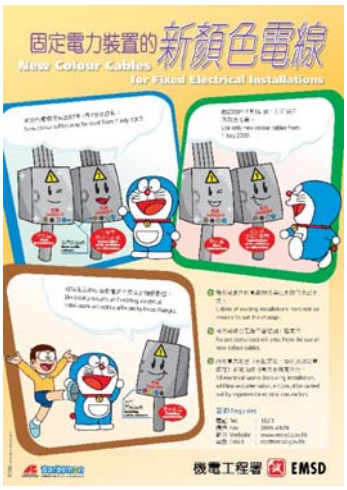
leaflets, posters, special notices, pocket cards, stickers as well as the aforementioned CCC web corner. Important information such as the implementation schedule, installation guidelines and training requirement for REWs are also widely promoted. Trade associations and unions contributed a lot in publicizing the training requirement through their own channels and urging REWs to get trained the soonest. In early 2007, a trade survey revealed that 99% of REWs were aware of the imminent change in July 2007.





As for the public, although they are not much affected by the change, they are informed of the change through different means including posters, leaflets, newspaper articles, CCC web corner and EMSD's half-yearly E&M Safety Newsletters. The two local power companies, CLP Power Hong Kong and the Hongkong Electric Co. Ltd. also help promote CCC messages through the electricity bills issued to over 2.7 million electricity consumers in 2006 and 2007. The key messages conveyed to the public are that the change is only applicable to cables of new installations, and addition and alteration to existing installations. Cables of household electrical products and existing installations are not affected, and therefore it is not necessary to replace cables of existing colours in response to the change. Moreover, adoption of new cable colours will not impose additional cost to the work. The public are also reminded that, irrespective of the change, all electrical works (including installation, addition, alternation, etc.) must be carried out by registered electrical contractors and workers.

Various trade organizations, academic institutions, property management companies, Occupational Safety and Health Council, Construction Workers Registration Authority, Labour Department, and other relevant government departments, etc. have joined our publicity programme to distribute CCC publicity materials to trade members and the public.



<u>Promotion to Non-Registered and Would-be Electrical Workers</u>

To further publicize the change and to enable future members of the construction and engineering industries to acquire practical knowledge of the change, EMSD has requested relevant course organizers to incorporate knowledge of the new cable colour code into teaching materials of their courses. Such course organizers include the Construction Industry Training Authority, Vocational Training Council (including the Hong Kong Institute of Vocational Education), Occupational Safety and Health Council, tertiary educational institutes, etc. With the assistance of the Labour Department, course organizers of the "Mandatory Basic Safety Training" (usually known as "Green Card" among trade workers) will brief their trainees about the new cable colour code. As such, allied trade workers in the construction industry are kept fully informed of the change and risk mitigation measures.

5. WAY FORWARD

In March 2007, the Working Group was renamed as the "Working Group on the Review and Implementation of Cable Color Code in Hong Kong" to better reflect its functions. EMSD, as usual, closely coordinates with the electrical trade and keeps on monitoring the implementation of the new cable colour code in Hong Kong and the latest development in other countries.

Since the commencement for implementation of the new cable colour code on 1 July 2007, the implementation has been smooth and no electrical incident in relation to the use of new colour cables has been reported. Our on-site inspections also reveal that the installation of new colour cables are satisfactory and compliant with our technical and safety requirements. On the cable supply aspect, supply of both old and new colour cables has been stable at the moment. We will continue to monitor the implementation status through regular site inspections.

The progress of training the trade workers has also been satisfactory. Up to December 2007, over 82% REWs have been trained on the new cable colour code, and it is estimated that 95% will have completed the training by the end of 2008. We continue with our collaboration with the trade and industry in providing relevant training and carrying out further publicity work.

Managing a change that affects the whole spectrum of the trade and the public at large has always been a challenging task. The cable colour change also affects the safety of trade workers and the public, for which no compromise can be tolerated. A safe and smooth implementation relies on the shared vision, collaboration, participation and support of the trade, and the adoption of a multi-pronged and phased approach with attention to implementation details. With the collaboration among the trade and the government reaching new heights through the change, we are confident that our vision for a safe and smooth change would be visualized in a not too far future.

Note:

1. A fixed electrical installation means a low or high voltage electrical installation that is fixed to premises but does not include any electrical equipment that obtains electricity from a socket outlet via a plug.

2. ESAC is a non-statutory body comprising of members from the trade (contractors, electrical workers, consultants, professional institutions, power companies, academic institutes, etc.) and the public (community leaders), and other stakeholders (property management companies, Occupational Health and Safety Council, Consumer Council, etc). Its objectives are to advise the Government of the Hong Kong Special Administrative Region (HKSAR) on matters relating to electrical safety.