

modations with moist and wet regime, where relative humidity of air GOST 30494 is not regulated (bathrooms, laundries etc.), Group G also includes the constructions of accommodations of specific function (ponds, surface parkings etc.) ■

To be concluded

MAINTENANCE Building Maintenance Units: An Essential Attribute of Contemporary Architecture

(p. 102-106)

TEXT BY ELENA GOLUBEVA,

PHOTO BY COXGOMYL

Building maintenance units (BMU's) are widely applied throughout the world to keep façades operable and clean in high-rise buildings and structures of average and low height. This is not just convenient, as with BMU's even a building of the most complex configuration will be perfectly clean, but it is also quite profitable, because payback period of such a system is no longer than just first years of operation, whilst its estimated operation life is not less than 25-30 years. This is the story dealing with quick, simple and safe façade maintenance with BMU's narrated by CoxGomyl Russia's General Manager, Vasilii Muntyan.

Vasilii, when did CoxGomyl open its office in Russia and what projects do you have here?

In 2006 our headquarters in Melbourne won the tender for equipment supply for Federation Tower. It was not convenient to manage the project from Australia, consequently it was necessary to coordinate operations on-site, taking into account Russian standards and requirements. Therefore at the beginning of 2008 the Moscow based office was opened and a Russian company with 100% Australian capital was registered. Now we collaborate in two projects: Federation Tower and Mirax Plaza. Today the works are not as intensive as they have been during the last year, but we keep supplying the equipment in accordance with contract specifications, not

withstanding financial distress of the customer and other contractors' slow deliveries, which our own operation depends on. Our corporate policy is one of working together with our customer as partners, and we are always willing to support them. The strong company reputation brings profits.

What kind of equipment is installed on Federation Tower? What are its features?

These facilities are as unique as the building itself. As known, its two sides are convex, which requires design and production of customised systems. These were manufactured in Melbourne, shipped to Russia, and presently the installation on one of the towers is nearly completed. Machines are placed at the 11th and 48th floors, and on the roof (pinnacle). On the 11th level the cradle slides along the monorail on the periphery of convex sides moving up and down. On the 48th floor the machine itself is located inside the building, and the cradle is fastened to a boom, which telescopes outside through a pivoting panel. Small hinged windows open in turn with the unit and the machine travels along the perimeter, and the cradle descends down to the 11th floor.

Mechanisms on the apex of the building are designed to be compact in order to minimize their visibility, and they are set in motion by a system of cables driven by hoists, located inside the building in a special hoist room. They are intended to maintain the convex sides from the 63rd to the 48th floors and the flat side - from the 63rd floor down to street level.

What is the difference between unique and regular units?

BMU's may be of different types: some look like mini-cranes, others are unlike, but nevertheless are of the same nature. This feature mainly relates to the equipment being of Australian origin. Our Spain factory specializes in equipment for servicing regular buildings - rectangular, round, oval etc. Such systems are rare customized to meet specific requirements of clients. Upon receiving an order, our engineers select an appropriate machine, based on the dimensions of a building and points on its surface which need to be accessed. Equipment of this kind is also produced in Great Britain and The United Arab Emirates, but in essence it is intended for local markets with a steady demand. Offices in Melbourne and Madrid commit to international orders, designing and manufacturing hundreds of unique and regular units.

How great is your share in the global BMU market?

CoxGomyl is now the market leader and the largest BMU supplier to a spectrum of buildings, from the

highest skyscrapers to low rise buildings. Regardless of the financial crisis, we are prospering in South East Asia, the USA and Middle East. European sales of predominantly regular BMU's are also progressing well. In Spain there is even special regulation ordaining to equipment on all buildings higher than 5 floors to be equipped with such systems. Buildings must be clean - this is an axiom; therefore building operators, especially operators of expensive buildings, do not spare resources to maintain their reputation. In Russia this market is not formed yet; therefore a BMU on a building is considered similar to an advanced option in a car, whilst this is a real value added. In Russia, industrial mountain climbers are often employed to clean glass façades, with no idea what to do if one of the panels breaks. Meanwhile, the panel may be large in overall size and weigh more than 200 kg, which would make it impossible to bring it in and install from the inside.

As a matter of fact, the BMU is sure to soon become an institutional component of a contemporary building, isn't it?

Beyond all doubt. If a company leases an office, especially of Class A, presentable appearance of a building is not of any less importance than air conditioning, advanced communication systems, wide-band Internet and so forth. This is an additional competitive advantage, which makes a building more profitable and increases its capitalization. All buildings should be clean regardless of their height and it is pleasant to live in a clean city.

Do you have any competitors within the Russian market?

Several BMU manufacturing companies operate here, but they are all represented by dealer networks. This means, I would like to emphasize, that their prices are higher due to a long reseller chain, and with less responsibility. CoxGomyl is the only manufacturer with a fully self funded office in Moscow with a team of engineers, managers, riggers, and this year we expanded the sales department. So far we have not manufactured in Russia, however, the capacity of our four existing works is fulfilling all orders. Our competitors are trying to reduce costs by locating their factories to the Third World countries, where labor is much cheaper than in Russia. For us, the performance and reliability of the systems we release is above all of the highest standard. Our head office is proud to meet ISO 9001 standards, and regular audits makes us sure that we are always up to date.

Do you cooperate with façade vendors?

Certainly. Coordination begins at design stage and continues throughout the process of construction and

installation. Harmonization deals with all parameters, since our equipment should perfectly fit to façade configuration. We have a lot of points of contact, and it is more than just the design of the equipment. It is necessary to provide parking lots for our units, determine location and dimensions of the technical room and so forth, and also to install stabilizing anchors along the full height, which restrains a cradle and prevents it from swaying by the wind, and which must be embedded into the façade elements while they are being produced.

Who install your units - specialists from Australia and Spain?

Installation works are always carried out only by our company's professionals in accordance with world standards and of course, including Russian standards. In Moscow we have an engineer from Australia who leads a crew of Russian riggers, who then proceeds with installation and adjustment of the equipment at all stages. He supervises the entire process.

How long is the warranty period of the equipment?

As a rule, 12 to 24 months. Equipment's estimated operating life is 25-30 years, and then it is necessary to renew it completely or partially. It raises the question of how to deliver it up to an installation place, if there are not any hoisting cranes? When Cox and Gomyl merged, our creative design brains developed a number of BMU's capable to operate on buildings of any height, and also developed equipment for replacing old units. They may be mounted even if cranes are not available. We keep on moving further updating our systems and offering something new.

Who operates these machines on the building?

This is always an issue for a building owner. In other countries we offer these services, but in Russia this market is still being deployed; therefore this service will be available soon. The Mirax Group organized its own maintenance service group, and we proposed to them a post-warranty service option. Owners of buildings equipped with BMU's from our competitors also turn to us, and we are ready to consider all proposals.

How often is it necessary to clean the façade?

Everything depends on climate conditions. In Europe, America, South East Asia and the Middle East it is considered that a building's exterior must be washed 4 times a year, i.e., once a season. The façade surface area and the capacity of each unit determines the number of units required. As a rule, each cradle carries 2 people, whose estimated cleaning output is 100 sq. m. per hour. More spacious cradles for 3 and

even 10 people are also available, but this presumes completely different loads on a building, and consequently specific calculations. If there are few machines, they work generally in non-stop mode circulating around the building. Cleanliness of a building in many respects is a matter of culture. If people lease offices or buy apartments for a great deal of money in a prestigious building, they expect windows to be clean, as they cannot do it by themselves. Moreover, the façade must be maintained promptly, without bothering tenants.

How is safety ensured? Is there any automatic machinery which can replace a person?

There are systems, which "creep" all over the building attached by suction caps, but it does not ensure appropriate quality grade. Everywhere in the world such works are implemented manually, even at heights of 800 meters. Workers are specially outfitted, buckled up and so forth. Their safety is provided, first of all, by absolute accurate engineering calculations, which is the basis for production and installation of such equipment. We literally hold the lives of our clients in our hands. Remembering this all the way, we always put safety first. Moreover, this rule covers not just existing equipment, but also each operation or procedure of our work. We are capable to adjust our equipment to basic design, production and installation standards of any country. I participated in test sessions of our systems in the tower of Shanghai World Financial Centre at a height of 492 m over street level, which is why I fully understand the requirements for safety.

What are the peculiarities of BMU designs for complex facades?

The primary task is to ensure access to the most "inconvenient" points of a building. This is achieved by using machines both with fixed-length and telescopic boom, which moves out up to 48 m. To access hard to reach surfaces telescopic cradles with a counterbalance are used, which may approach the façade due to the centre-of-gravity shift. The units may be located either inside the building, then the window opens and the boom is projected; or on the roof. It is possible to design everything, depending on the requirements and financial capacity of a client. CoxGomyL carries out any wishes, but at the same time proposes its own solutions, which are, as a rule, more rational and, therefore, feasible.

What are the basic stages of your work process?

These are: design, production, installation and maintenance. Work begins when the design documentation of a building is available and a general contractor, who selects subcontractors, is specified. After

examining drawings, we present our proposals with an estimated number of units, their location, productivity, preliminary loads, kinematics and so forth. If our proposals are accepted, equipment is mated with the specific building data in more detail so that there would be no issues. At the moment of a unit's approval all questions concerning loads, arrangement of parking lots and so forth are settled. When a machine is produced and thoroughly tested in the workshop, it is dismantled, delivered to the site, mounted and enabled.

What problems do you come across in processing an order?

It takes a certain amount of time to acquire materials, to plan production and deliver equipment, but builders often change schedules, whilst design organizations detain drawings approval, and we cannot yet start fabrication of a machine. When a unit is produced and delivered, it turns out that builders already completed the floor specified for the unit, and we have to work on the planned placement. That is why, in my view, the major managerial problems are harmonization and coordination of work with other contractors, which takes time, especially in Russia. The building process is a kind of magic, but we try to seek to compromises. At the same time CoxGomyL believes that there are no problems which may influence quality of supplied materials and production performance. There were cases where we had to remodel the work of a contractor, because it might have affected the reliability of our systems. The company carried out this work at its own expense - safety and reputation is more important than money.

CoxGomyL was formed and incorporated in 2008 by the merger of E.W. Cox, Cradle Runways and GomyL s.a. But Cox was formed much earlier - in 1953, when E.W. Cox was a pioneer of external building access systems in Australia. E.W. Cox is an engineering company specializing in the design, manufacture and installation of Building Maintenance Equipment (BME) and Access Equipment. E.W. Cox's design and manufacturing base is located in Victoria, Australia. E.W. Cox specializes in providing solutions to the world's tallest and the most complex buildings including Taipei 101, Shanghai World Finance Centre and the 818 meter tall Burj Dubai.

GomyL, s.a. was established in 1989 by a team of specialists in the field of engineering. Their main objective is to design, manufacture, commercialise and distribute cleaning and maintenance equipment for high-rise, multi-storey building façades. Cradle Runways was founded more

than 50 years ago in Brockley, UK specializing in customized facade access equipment for tall structures.

Today CoxGomyL is the world's leading provider of Building Maintenance Units. Its offices are located in Melbourne, Sydney and Queensland (Australia), Madrid (Spain), London (UK), Shanghai, Hong Kong and Macao (China), Dubai (UAE), Doha (Qatar), New York (USA), Moscow (Russia) and Singapore (SE Asia). Designing and manufacturing of integrated building systems are being carried out in four locations: Melbourne, Madrid, London and Dubai. Melbourne capacities are oriented towards production of façades of complex configuration; Madrid factory produces regular equipment for low- and mid-rise buildings with ordinary façades; London and Dubai fabrication facilities generally operate in local markets. The company employs approximately 500 staff, including offices and trade missions across the globe.

BMU's are designed as a part of a building in line with world safety standards. These roof-based devices may be fixed or mobile using special guides or railways, or even without any complementary facilities. The systems are equipped with easy-to-handle cradles controlled from a cradle itself or from a machine. ■

VERTICAL TRANSPORT KONE Eco-efficient

**(p. 108-109)
INFORMATION PROVIDED BY
KONE**

Sustainable technologies for contemporary city

Growth rates of modern cities are positively striking. More and more companies are craving for offices within bustling hearts of business life, brand new office and residential buildings are being erected not just in outskirts, but also even in already densely developed city centres. Exactly under such conditions the energy-saving solutions are becoming urgent the most, because their application allows to make new or old house environment-friendly, and also decreases dependence of lift equipment on municipal power supply, as a result, it reduces expenditures for building maintenance.

KONE, which has been manufacturing lift equipment since 1910, have been trying hard to develop sustainable technologies, which ensure further perfection of solutions combining innovations, usability, comfort, and also environmental safety even here and now. This particular series

characterized by implementation of such solutions and technologies is called KONE Eco-efficient.

Thanks to employment of state-of-art technologies KONE Eco-efficient elevators and escalators help many companies worldwide to reduce costs for equipment maintenance, and furthermore, to meet the most exacting ecological requirements.

The pilot and vanguard KONE technology, which relates to KONE Eco-efficient product line was KONE EcoDisk, implemented in elevator equipment still in 1996. Because of this technology the hoist of elevator became direct-driven, which made it possible to eliminate the need for engine lubrication, and the key point is reduction of elevator's energy consumption by 25%! Now, there is no need for machine room - all necessary motion mechanisms are arranged directly in elevator shaft, ensuring space saving. Along with it KONE EcoDisk drive load capacity is by no means inferior to cable and hydraulic drives and it is capable of moving the car at 1m/s speed.

For the passed years the KONE specialists enhanced existing technologies and developed a number of novelties. Thus, majority of KONE elevators is supplied with built-in power generators, which transform potential energy of descending car into useful electricity, which can be utilized for heating, illumination or other needs. Regular elevators simply lose energy while descending, whereas this potential may be usable, which increases efficiency of the system. On average such a system is able to compensate by 25% of energy spent on ascending, and consequently with correct operation it is equivalent to reduction of power bills for elevator equipment by one fourth!

Another effective energy-saving technology is switching of elevator or escalator into standby mode. According to some estimations, turned off light and ventilation in lift car, and also stoppage of escalators in absence of passengers promise decrease of energy consumption by 30%. The only thing to do is to implement rational hoist equipment management system, and KONE specialists willingly undertake this task.

In addition, it worth noting that all contemporary KONE elevators are equipped with LED lamps, which consume by 80% less power than ordinary halogen lights used in the majority of elevators. Taking into account that by 35% of power, spent on elevator operation is illumination cost. Savings on this item may become positively solid comprising up to 560 kW per year for each car.

Well, and the ultimate pattern of hi-end eco-efficiency are sun-powered elevators. Contemporary solar batteries are capable of providing elevator with power pretty sufficient for operation by transform-