



'HOPEful' About Smart Cities

Meet NCS partner, a team of engineering commandos who builds high-performance engineering solutions—HOPE Technik.

A prototype of a space plane, machines that lift 200 times its weight—all sound like a sci-fi movie come to life, but in reality, these machines are real and proudly made in Singapore.

The company behind this is HOPE Technik, their passion for high performance engineering is evident—from the variety of products they have developed, and the first of 10 commandments that greets visitors in their office lobby says: "It is a passion and a career, not a job." A tour of their black three-storey building in

Jurong is like walking into an inventor's workshop.

It took a few years, but NCS and HOPE Technik have formally signed a partnership agreement to fuse high performance engineering solutions with the intelligence of IT.

In February 2015, NCS and HOPE Technik inked an agreement to develop smart city innovations.

Together, they will identify areas where technologies can be used to solve business challenges, prototype ideas, and conduct proof-of-concepts.

They will share knowledge and capabilities. Where they can, they will complement each other to build solutions that could be for Internet of Things (IoT), software platforms and sensor networks for smart city management.

"Recently we have been looking a lot at smart city technologies, with growing interest from customers. One of the smart city technologies that we can work on with NCS is to integrate perimeter security technologies with the impressive Intelligent SURF Centre (ISC)," said Michael Leong, general manager at HOPE Technik.

The ISC is like a high-tech mission control, with dashboards that display updates that can include real-time and geo-target alerts, live city data feeds, situational awareness information on 2D/3D spatial maps, or responses from various agencies, etc. It is a proprietary platform developed by NCS.

MAKING LIFE EASIER

HOPE Technik's work is founded on two main premises. One of which is automation, and the other is force multiplication, a military principle of using additional factors to increase your power.

"We aim to use automation for productivity, to remove dull, dirty and dangerous work that humans have typically left to robots. It could be pushing things from point A to B, or a soldier managing and sending six drones, instead of six soldiers, to scout the situation," said Leong.



- 1 It is a passion and a career, not a job.
- 2 We are engineering commandos. Small in number, strong in force.
- 3 We believe in doing things right, never take the easiest or most common way.
- 4 Focus on the goal, enjoy the process.
- 5 Our best intentions and ideas are put into production, and if there are problems no blame goes to anyone, we will all fix it
- 6 There must be a minimum number of reports required, but important work must be recorded.
- 7 We do not reinvent the wheel, we adapt and modify proven solutions to give reliable results.
- 8 We test the project's operation and functionality at each and all stages
- 9 We learn from yesterday, live for today, hope for tomorrow. Always never stop questioning
- 10 We respect ourselves, our colleagues, our vendors and our clients.



An example of this is drones that carry cameras for army scouts. Their Spider Surveillance System is a drone technology, which HOPE Technik has used to build unmanned drones for military and commercial clients.

FORCE MULTIPLICATION

A powerful demonstration of force multiplication is the company's creation of the Red Rhino for Civil Defence Force, a light fire truck that is custom-built at HOPE Technik's premises in Jurong. It can do the work of several men, and can manoeuvre into the corners of a HDB void deck. It is equipped with a hydraulic system for rescue tools, a water mist gun, a water monitor, and is the first compact urban vehicle in the world to feature an integrated compressed foam system.

Another of their inventions based on the idea of force multiplication is Sesto, a set of technologies that ease the act of moving heavy objects in confined spaces.

The creation of Sesto, an Automated Guided Vehicle (AGV), marked HOPE Technik's entry into the medical industry, when it collaborated with the National University of Singapore on

research to create the omni-directional wheels on hospital beds.

The mobility wheel can move the motorised bed in all directions, as well as make sharp turns down narrow aisles in hospitals. Sesto also lessens the manpower needed to move the hospital beds—where it used to take 2 people to push the bed, Sesto requires just one person. Its force multiplier capability means a 200kg weight would feel like 2kg.

HOPE Technik plans to apply this wheel design to other industries, such as logistics and warehousing management. The company even modified a smaller version into an autonomous waiter on wheels, which silently and efficiently served canapés and circulated among visitors during an event held in Singapore last year—while avoiding any obstacles in its path.

Another force multiplication technology that HOPE Technik has tinkered with is exoskeleton technology, that is reminiscent of the suits worn by Tony Stark in Iron Man, and Matt Damon in Elysium. This technology consists of a back brace and leg braces with in-built motors that allow wearers to carry extra weight on them.

Possibly the furthest boundary that HOPE Technik has pushed is into space. They have designed, built and launched an unmanned space plane prototype commissioned by the French aerospace giant Airbus Defence and Space. The test flights over the South China Sea last year were part of tests to assess the aviation electronics, aerodynamics and glide capability of the prototype plane.

Of the company's 50 staff, more than half are engineers. These "engineering commandos" as

mentioned in their second commandment "We are engineering commandos. Small in number, strong in force," are what distinguishes HOPE Technik.

To find team members, the company takes on interns, which provides an opportunity to find people who fit in with their culture and work environment.

"They need the right skillsets, the right attitude and the willingness to build things. It's all very hands on, you have to touch circuit boards, do soldering and repair your own wires. You have to be prepared to get dirty," said Leong.



Looking forward, HOPE Technik will continue to push new boundaries.

"We don't stay comfortable. Each day is definitely painful and that is the reason for the colours of our logo. Red is for the blood we spill, white is for the sweat, and black is for the breakthrough," said Leong.

"This is our life, to gain knowledge. Here we have people we can spar with technically, and we enjoy the challenges of the work we do," said Leong as the interview came to a close and he walked away, ready to face yet another challenge and to push another boundary.