

2004 Australian National Plumbing Forum

This series of reports summarise the papers presented to the 2004 Australian National Plumbing Forum held 3 to 4 September 2004 at the Sheraton Perth Hotel, Perth Western Australia and also provide conclusions reached by the attending Plumbing Professionals from Australia and the World. The Forum was hosted by the Institute of Plumbing Australia Incorporated.

Note: The following has been transcribed and condensed from audio recordings and notes of the forum proceedings and not from written papers provided by the speakers. As such, matters in these reports do not constitute advice of any kind but provide a general overview of items discussed. Anyone reproducing, quoting or acting in any way on items contained herein do so at their own risk.

Day 1 – Friday 3 September 2004.

Introduction: Mr Paul White – President - Institute of Plumbing Australia

Ladies and Gentlemen on the behalf of The Institute of Plumbing Australia I would like to welcome you all here to this National forum in Perth. For those who don't know much about the Institute it was actually formed here in Perth in September 1954 which is why we are celebrating our 50th Anniversary at this time. The Institute was formed by a delegation of the then Federated Masters Plumbers Association. It was formed as the Institute of Plumbers and in 1964 it changed its name to the Institute of Plumbing Australia and later became an Incorporated body. This Institute has in its membership and still has today broad based professional persons in the category of contractors, consultants, lecturers, suppliers and manufacturers so it is a very broad based type organisation.

The forum itself today will obviously involve your selves so whatever we wish to get out of this forum we would like to see involvement from everyone here. There are some excellent speakers and some excellent topics and discussion is from the floor so please feel free to answer, debate, discuss and that is why we are all here to get the fellowship and information across to other people. So please enjoy it, take everything in I hope we all get something out of it and we will bring up the first guest speakers. Thank you.

The first topic of Health and Plumbing was spoken to by Mr GP Russ Chaney, Executive Director of The IAPMO Group and a Director of the World Plumbing Council.

Mr Russ Chaney – Executive Director – The IAPMO Group

Good morning. Certainly it is a pleasure to be in Perth. The outbreak of the SARS epidemic in the South Eastern Region of China and then of course out to various other portions of the world presented the plumbing industry with the unique opportunity to focus the value of what we do as an Industry. Over the past few days the World Plumbing Council has conducted its 2004 Annual Meeting. During that meeting we talked about the fact that when the plumbing Industry does its job well no one knows about it. And it is a situation like the SARS outbreak that enables us as an Industry, a World Wide Industry, to focus on the value and the importance of what we do as a plumbing fraternity, in protecting public health, providing safe and sanitary living conditions and of course potable water supply.

2004 Australian National Plumbing Forum

So what I would like to do today, well let me just step back for a moment this is the current make up of the World Plumbing Council Executive Board it is very broad, Australia is represented, the United States, Hong Kong, China, England, the United Kingdom, of course Robert Burgeon from Scotland and George Very who is from New Zealand. So we have a very diverse membership that provides a broad geographic representation and of course a representation of broad interest so that the policies and programmes that are developed are developed in a manner that is representative of the Industry as a whole. We have a long way to go. There are many regions of the world that are not a participant in the World Plumbing Council and I think it is incumbent among all of us that to work towards bringing these other groups in. For the most part the World Plumbing Council is an English speaking organisation and the folks from Australia, New Zealand and the UK tell me that I don't speak English but I would argue that point. Let's carry on.

The topics that I would like to discuss today are an analysis of the SARS viral outbreak in the Amoy Garden apartments in Hong Kong, China. Proposals that came out of that analysis to prevent future similar type outbreaks and a report of the World Health Organisation informal consultation which took place in Rome Italy just under a year ago and WPC's involvement and by default the Plumbing Industry's involvement in protecting public health by ensuring good plumbing practice. So an analysis of the SARS viral outbreaks at the Amoy Garden apartments in Hong Kong special administrative region and I don't see Henry Hung here, he is not here right now, he will be joining us, I should note that this presentation was developed by Henry Hung. Henry as I mentioned is an executive board member of the World Plumbing Council and is located in Hong Kong. And when the outbreak occurred and the architectural board and the public health offices in Hong Kong became involved in trying to determine what occurred about 18 months ago in February of 03, Henry being an executive board member of the World Plumbing Council and being very active as a contractor in the Hong Kong community, represented us at the ground level and this presentation is modified but it is taken from a presentation that Henry presented at the 2003 World Plumbing Council meeting last year in Detroit Michigan in the United States. And of course I have the pleasure of presenting the information partly developed by Henry.

It turns out that well over 300 people died in Hong Kong as a result of the SARS outbreak. That is by some standards not very much when you consider some of the other virus outbreaks that have occurred over time. But the fact that it was initially not easily recognised and more importantly there were no ways of preventing it from occurring, medically preventing it, it was a huge shock to the world. People affected were apartment dwellers, nurses, medical doctors, and front line workers. Of course when people became ill with the SARS virus and of course we did not know what the SARS virus was at the inception of the outbreak of course they went to the hospital they went to the doctors and the front line medical profession not knowing the severity of the disease or the virus didn't take the proper precautions in treating these people. So they themselves become infected and a lot of those, I am not sure the exact number but a large portion of the people who died in Hong Kong were in the medical profession involved in treating the index patient and some of the other patients that became ill subsequent to that.

The index patient ironically is, or was a 33-year-old medical doctor he is now deceased. It is believed that he is the one that originally came down with the initial strain of the virus. He developed the SARS symptoms in February of 2003, although it is believed that he actually became ill with the beginning part of the virus early as November of

2002. Being a medical doctor in the South Eastern region of China he went on holiday to visit his brother at a place called Amoy Garden apartments, which are in Hong Kong. On or about March 19th of 2003 he became ill. He had diarrhoea, was severely ill, he got sick at his cousins apartment at the Amoy Gardens and went to the Prince of Wales Hospital in Hong Kong. The doctors there could not figure out what was going on - they conducted a number of tests but the first indication of something major happening was when two nurses at the hospital became infected - but again they weren't sure exactly. So the virus spread quickly because of the uncertainty of the virus. From around late February, early to mid March to April 15th there were over 321 documented cases just in Hong Kong.

Approximately 240 families were evacuated to temporary campsites when it became apparent that there was a high concentration of SARS infected apartment dwellers at the Amoy Gardens. They simply quarantined everyone at the Amoy Gardens and moved them to a dedicated site where they could keep an eye on them treat them hopefully and try and nurse them back to good health. So it was a major effort by the Hong Kong Health Department and ultimately by the World Health Organisation to try and stop the spread of the virus.

Before I carry on, let me just mention that from the plumbing industry perspective we are going to focus on the outbreak at the Amoy Gardens. It is important to remember that there was an outbreak at the Prince of Wales Hospital but again that is believed to have originated from the index patient going to the hospital for treatment. There was also an outbreak in a Hong Kong Hotel it is not completely clear at least in our mind where the linkage occurred with the infected individual becoming ill there. So we are going to talk about the Amoy Gardens apartments. The Amoy Gardens complex consisted of a number of high rise residential apartment buildings of 30 – 35 storeys in height with very, very high concentration of individuals living at those apartments, the average size of the apartment or living space was not more than a couple of square meters so they are very, very condensed. The index patient again the medical doctor from South East China visited his cousin at building E. Building E is in the North to North Western region of the layout and the prevailing air currents on the day or on or about the day of March 19th through about March 27th transmitted the disease throughout the whole apartment complex or the majority of it. The units with the highest infection rate were buildings B, C, D and E a cluster of buildings in the north western region of this apartment complex.

A side view of the buildings showed pipe chases or what we call re-entrance or open area utility channels. These re-entrance spaces provided a number of items for the apartment dwellers. They were primarily pipe chases. The drainage lines, the water lines, were run exterior to the building in these re-entrance spaces. And the re-entrance spaces were essentially three sides with the fourth being open to the airway. And three apartments, come together, in those re-entrance spaces. There are bathroom or other windows from separate apartments on all three of those walls and that was one of the leading contributors to the fast spread of the SARS virus. The SARS virus as it turned out spread partly by chimney effect as the air rises through the re-entrance space.

When I have given these presentations in the past I have always hoped that they were after lunch. But we are going to talk about diarrhoea, faecal droplets, the faecal droplets are what contained the SARS virus. The World Plumbing Council, the World Health Organization and the Hong Kong Health Department and Architectural Board compiled very detailed reports that explained what occurred and how it occurred and why it occurred at least to the greatest extent that they could predict. But essentially what is happening here is faecal droplets containing the SARS virus got into the bathroom

space and then were exhausted into the re-entrance space and through air currents that chimney effect in the re-entrance space and the prevailing winds on or about that 10 day period when the effected individuals were still at the Amoy Gardens enabled the virus to spread very quickly throughout the apartment complex.

Forty two people died in building E as a result. There are four units per floor. So two of the units face on two sides of the building. There was a very, very high concentration around units 7 and 8 in building E that is where the cousin of the index patient resided. The virus spread to neighbouring units predominantly units facing the prevailing wind.

There were some environmental investigation major findings, there were frequent complaints of fowl smelling bathrooms, we will talk about that in a moment, there were intermittent stoppage of supply of flushing water to the toilet and it was disclosed that the maintenance personnel at the Amoy Gardens had recommended to the living inhabitants of the apartments at different times to flush their toilets with salt water because of the limited portable water in the Hong Kong area. Further they determined that there were cracked waste lines leaking on units below the index location. And it is believed that some of the SARS virus escaped through those cracked waste lines and was a leading contributor to the spread of the virus below the index patient apartment complex.

Diagrams that were extracted from the Hong Kong Health Authority Report illustrate the piping configuration prior to the SARS outbreak at the Amoy Gardens. These diagrams show that the bathroom floor drains connect to the soil stacks and although trapped are not vented nor do they have any means of maintaining the trap water seal. There was an extractor or an exhaust fan in the window in one of those three walls and when the index patient went into the bathroom, had diarrhoea, of course turned on the fan, the fan was oversized by ten times, it was way oversized for what was needed to exhaust the bathroom. So, when the fan turned on, the faecal droplets were essentially sucked through the soil drain line through the floor drain trap, unprotected trap, and into the bathroom space and then exhausted out, into the re-entrance space. It was very, very quick and very, very intense because of the over sizing of the extractor fan and it just simply blasted the SARS virus or the faecal droplets containing the SARS virus, throughout the re-entrance space and that is why there was such a high concentration of infected patients particularly in building E.

The prevailing winds during that time period blew the faecal droplets containing the SARS virus to other buildings in the complex, and when it was all traced back and they looked at the prevailing winds during the time period that the majority of the people were inflicted, the inflicted individuals - their locations matched perfectly with the directions of the prevailing winds. So that is how the conclusion led to the fact that the floor drain trap seal that had been violated was one of the leading contributors to the release of the faecal droplets containing the SARS virus.

Now there are two reasons that the floor drain trap seal failed. The first that the trap itself was held together with two metal screws. Those metal screws rotted and the water in the trap seal leaked out from the open holes that were left from those screws. Secondly there was no replenishment mechanism, so once the water either evaporated or leaked out there was no method of resealing the trap seal.

In the United States we don't permit floor drains in residential flats. They are typically used of course in commercial installations and various designs. But most folks don't wash their floor with a bucket of water they will use a mop or not at all. And because there was no replenishment mechanism either through a trap primer or some other fixture draining through that area it provided an open airway for the faecal droplets to

exhaust through the plumbing drain line into the bathroom space and then out into the re-entrance space and throughout the entire complex.

As I indicated both the World Health Organization and the Hong Kong Health Authority did essentially side-by-side comparisons or analysis to try and understand what took place. The conclusions in both cases indicated that the primary exit point of the faecal droplets containing the SARS virus were from the trap in the floor drain.

The World Health Organization came to the conclusion that the oversized exhaust fan was one of the leading contributors that led to the exhausting of those faecal droplets into the common space. A Hong Kong Health Authority took the conclusion that once it got into the re-entrance space, the chimney effect of air current in that re-entrance space led to the quick dispersal of the faecal droplets. I think from our perspective and we will get to this a little bit later, it is an important finding because as I said when things don't go wrong nobody realises what we do as an Industry. But things went wrong during this time period. And I think the World Health Organization, the Hong Kong Health Department and now as a result of us conveying this message, many other people throughout the World understand the role, and the importance of what the Plumbing Industry does.

I feel like I am speaking to the choir here so you don't need me to tell you that both concluded that the spread of the virus was linked directly to inadequate plumbing system at the Amoy Gardens. And we need to re-empathise that because we will see and you can see directly if you are on either the World Plumbing Council Website, you can go on the IAPMO Group website, you can go on the World Health Organization Website, and you can download the reports that directly identified the loss of trap seal in the floor drain as the primary pathway of the faecal droplets containing the SARS virus and that is an important finding certainly.

The Hong Kong architectural board made recommendation to professional bodies for immediate action. Proposals for new projects, specially designed traps, material changes, elimination of floor drains or introduction of trap seal primers.

The Hong Kong Government took a number of immediate steps they formed what was known as a team clean to implement stringent regulations to ensure code compliance, one of the things that was denoted that there was very, very or in some cases, non existent inspections to verify code compliance. The Organization that I represent the IAPMO Group we administer and develop the plumbing codes that are used in the United States and we are essentially an association of plumbing and mechanical inspectors and obviously this type of recommendation is central to what we believe in. Secondly, to provide heavy penalties for those that intentionally violate the code. Thirdly, to establish a working group on building design for a clean and healthy environment. That group has been formed and Henry Hung is a member of the group.

Conclusions and recommendations that came out of the analysis and again I feel like I am speaking to the choir but it is good to see that they highlighted the importance of the things that are central to what we do. The need for good plumbing design. That workers or installers or contractors need to comply with the standards that we all maintain a fully trained work force. These are things that we have talked about for years but it is important that the Hong Kong Government put these things in their report as recommendations on how to limit the future type outbreaks. To ensure proper installations through verification by inspectors and to verify regular maintenance through a third party inspection. Maintenance personnel in the Amoy Gardens had made alterations that were simply abominable they were not proper plumbing. When they

2004 Australian National Plumbing Forum

quarantined everybody and started moving them out of the apartment complex they started tearing walls apart to try and determine what had occurred. There were dozens if not hundreds of code violations that were found as a result of the maintenance personnel or untrained contractors that did work at the apartment complex over a period of time and simply just created very, very unsanitary conditions. These matters were included to add emphasis when I had the honour of giving this presentation to the World Health Organization so we were obviously trying to send a message to the medical profession and the microbiologists that were present at that meeting. Of course plumbing directly affects human lives and plumbing is a professional trade.

Over the past two days in the World Plumbing Council meeting we continued to talk about the importance of sending the message to the high school guidance councillors and to the Industry in general and to the public I think is perhaps importantly or perhaps more importantly to the public about the importance in the professionalism of the plumbing industry. Maintaining the linkage towards plumbing and public health that is what the World Plumbing Council is all about.

Now after the SARS outbreak in Hong Kong the World Health Organization, I think we will all remember this, had announced travel advisories and being in the United States I can remember how those travel advisories had a huge negative impact on the city of Toronto Canada and the advisories had come out just in our spring in late April early May of 2003. And those advisors just eliminated the tourism season for Toronto and had huge financial impact but the World Health Organization was reacting, they weren't sure what they were dealing with at that time, and they felt that it was better to be conservative and cautious rather than not do anything at all. So were going to talk about an informal consultation or essentially it was a meeting of 11 experts that the World Health Organization brought into Rome Italy in September of 2003 to talk about what we do for the future because by September of that year WHO had already conducted at least two meetings of which the Plumbing Industry was not invited but they had a much better feel for what had occurred and why it had occurred. The World Plumbing Council was invited to that Rome meeting and we had significant input. And that input can be validated in the form of a couple of documents that the WHO released, subsequent immediately subsequent to that meeting. One was a press release and the other was a consensus statement. So, the initial reports and some of this is a bit redundant but I think it bears a value in repeating it, the world wide outbreak occurred in the first quarter of 2003 on April 10th. By April 10th so it is about three weeks after the first known case, the index patient case at the Amoy Gardens, there are 2800 cases reported in three weeks time I mean that is a huge concentration in a very short amount of time. 111 people had died by that time World Wide and there were individuals affected in 17 countries on 3 continents as of April 10th of 2003.

The countries that were hardest hit were China / Hong Kong, Vietnam, Singapore and as I mentioned Toronto, Canada. At the time the diagnostic testing that the medical profession as well as the microbiologists had proved more problematic than hoped. Essentially what that meant was they didn't have a way of identifying what was happening or at least a way of doing that with a high probability of success. So they were shooting in the dark. World Wide travel accelerated the spread of the virus again the high concentration in Hong Kong, again Hong Kong is a major hub for International Travel, and it spread North America, Vietnam, and Singapore very, very quickly.

2004 Australian National Plumbing Forum

On March 26th, we are going to revert a little bit; W.H.O. quickly brought in and convened a meeting involving 80 clinicians from 13 countries. They went to the scientific community medical profession to try and understand what was happening they were getting reports in various regions primarily in Hong Kong at that time that an unknown virus was turning up and at the time they didn't even know what to call it, we now know it is SARS. By mid April, so approximately six weeks to eight weeks after the index patient turns up or is infected, believed to be infected. In mid February of 2003 Morgan Stanley estimated the economic impact of SARS to be greater than thirty billion US dollars. Thirty billion dollars. And that was back in April of 2003 that is what they were projecting the estimate to be based on what they knew at that time.

On March 26th WHO as I indicated convened its first conference of 80 clinicians from 13 countries subsequent to that meeting they then convened a global conference in Kula Lumper in June of 2003. That was a major meeting there were probably in excess, I believe the number were in excess of 250 or 260 medical professionals microbiologists health people from around the world that came to a conference in Kula Lumper hosted by WHO to try and analyse what had been taking place. Now by June of 2003 a study had just been concluded by Health Canada. Health Canada is one of the few rapid response teams that WHO has at its use. Health Canada was summoned in late April early May to the Amoy Garden apartments to try and determine what took place how it took place and as importantly what to recommend to try and stop this spread again this was in late April early May of 2003 they were starting to get a feel for what the virus was and how it was spreading so they called in the Health Canada rapid response team and it was Health Canada that wrote the report that is on those websites that I mentioned earlier that gives us an in depth view as to what occurred at the Amoy Gardens and other Hong Kong sites and there was also some studies done in Vietnam and Singapore.

The Kula Lumper global conference demonstrated that there is a need for the importance of a world wide surveillance and response capability, essentially it validated what WHO had already done although it recommended that WHO enhanced its preparedness so that future outbreaks could be responded to in a more expedient manner and that the appropriate personnel were part of the response or rapid response teams so that it was just not limited to the Medical Profession or the scientific community and we are going to see in a moment that the informal consultation that WHO convened last September in Rome leads to that conclusion.

The conference also validated WHO's ability to convene International Experts quickly although from our perspective as the World Plumbing Council or as the World Plumbing Community we were absent from both of those initial meetings. I think the basic reason is that at the time they didn't know or they didn't draw a direct conclusion to the Plumbing System as a leading contributor to the spread of the virus. But they now understand the value of having us at the table. In July 2003 our Secretary Andy Watts in England received a letter, an invitation from WHO requesting that WPC send a representative to be one of 11 experts to attend this informal consultation at Rome Italy at the WHO European Centre in Rome. As I said the consultation venue was at the European Centre for Environment and Health in Rome the Conference took place over 3 days the 23rd the 24th and the 25th of September.

WHO had a number of objectives in going in to this informal consultation. The first was to review information on transmission of faecally shared viruses including SARS. And I think we should realise or just keep in the back of our minds that SARS was the focus of that meeting as it was with prior two meetings that the WHO had convened. But by the

time the informal consultation took place in Rome in September of last year SARS was still central to the theme of the meeting but it was also understood that other viruses were to be considered in forming recommendation and in identifying roles that various sectors of the Industry, our Industry, the Medical Profession, and so forth can play in protecting against the spread of faecally shared viruses.

Another objective was to recommend a framework for risk assessment and risk management. WHO and the greater medical community uses risk management and risk assessment as a central tool in recommending alternatives to protect against viral outbreak and to review the adequacy of established good practice to control SARS and that meant a lot of things although at the time we did not realise it. But WHO produces a document, it has been on a three-year cycle over the past two cycles, known as the guidelines for drinking water quality. Those are major documents that are focused on providing potable water and provides acceptable levels of certain ingredients or chemicals that are recommendations that go out to its member states throughout the world.

The guidelines on drinking water quality, the newest edition I believe is coming out in 05 and in a short moment I am going to defer to a project that the World Plumbing Council has been involved in on behalf of the WHO in updating a document that was drafted or published back in the early 1980,s, we will get to that in a moment. Further to identify critical requirements in preventing the spread of SARS and to determine weather common shortfalls and practice merited targeted action and further to integrate the recommendations or recommended actions into safety plans. And we will see that the safety plans that are now available or are now being released by WHO part of those plans contained recommendations from the Plumbing Industry. So further to ensure safety plans are compatible with the overall approach recommended in the WHO guidelines for drinking water quality. So the guidelines for drinking water quality is the central mechanism that WHO utilizes in sending health related information as it relates to sanitation and water to its member states. They are bringing in the SARS virus outbreak and adding it into the guidelines for drinking water quality because there are sections in there on sanitation.

Lastly to include an analysis of the findings from the Amoy Gardens outbreak.

At that 3-day meeting in Rome, probably 90 % of the time was focused on the Amoy Gardens outbreak. Because, and there is a reason for that which we will see in a minute. I may get ahead of myself. The World Plumbing Council when it sent its representative to that informal consultation in Rome had a number of objectives. First was to analyse available information from the Amoy Gardens outbreak to identify what occurred within the plumbing system on the drainage site.

The Amoy Gardens outbreak resulted from as we know, the loss of a floor drain trap seal, either through evaporation and through the defective trap, I have a slide which contains a video, a short video and a short audio portion that illustrates to the layperson what a trap seal does and more importantly what a vent does to maintain that trap seal. This Illustration when it was shown at the WHO informal consultation to the other 10 experts that were there all of whom of course were outside of the plumbing industry although it was a very basic illustration of trap seal and venting help the medical profession and the microbiologists understand, visually understand why trap seals are important and of course venting is important so it served its purpose and it worked very well to help us illustrate to people outside of our industry the importance of what we do.

The second objective from the World Plumbing Councils perspective was to identify how viruses can spread from a plumbing system to the living space and we particularly did not only focus on the SARS virus because as we know there are many other situations that have occurred over time in different regions of the world where viruses have led to illness or death and have been a direct result of insanitary or unsanitary conditions in proper plumbing or the lack of plumbing as we know it. Escape of viruses from the plumbing system can occur in a number of different manners. It can occur from clogged drain lines, it can occur from back siphonage, which of course results from a lack of free air movement within the piping system. And as we saw from the Amoy Gardens occurrence it can occur from the loss of a trap seal, which typically results from a lack of seal replenishment or siphonage due to the lack of venting, and lastly it can result as we also saw at the Amoy Gardens from defective piping materials and from defective or inappropriate workmanship.

The third objective that the World Plumbing Council had going into that informal consultation was to identify provisions in building regulations and inspections that could have contributed to preventing the spread of the SARS corona virus. I think most of the codes of practice, plumbing codes, health codes, in the vast majority in the industrialised nations in the world have provisions that are directly related to protecting from viral spread. There are many, the majority of the other countries have nothing or they have it and they have no mechanism of ensuring that it is installed and maintained or designed properly to operate. So that was an essential theme of ours going in. This was, and again, this was extracted from the Hong Kong Architectural Board Recommendations the typical design of residential flats with no floor drain in the bathroom. That was the recommendation made on our behalf was essentially to eliminate the floor drain in residential flats bathrooms. On most national modelled codes, or codes of practice, floor drains are not provided in restrooms. That was a major debate at the informal consultation. Some in the medical profession believed that it was essential that living space be kept clean and as sterile as possible and I don't think that anybody would argue with that. And they saw floor drains as an essential part of the occupying persons ability to maintain that environment, we argued that for quite a while and I am not sure why this is going down but its when they are provided, a means of replenishment must be used.

Essentially if you are going to put a floor drain in it has got to have a primer or some other mechanism to ensure that the trap seal, the integrity of the trap seal is maintained. It is also important that lay persons understand the importance of air circulation in drain line the importance of venting a properly designed waste and venting system must be maintained, the fourth and final objective was to recommend key revisions, to codes of practice. The codes of practice in place in Hong Kong were based on British Standards. And for the most part they were very, very good. The problem was they weren't complied with they weren't even used in many cases, the people that I may have illustrated earlier that were working on the systems at the Amoy Gardens were not licensed they weren't competent they weren't trained and we have now seen what happens when those type of circumstances all occur at the same time.

Although the Amoy Gardens outbreak occurred in a high-rise apartment complex, we should note that a similar outbreak could have occurred in other building types of varying size and occupancies. Thus the mitigation procedures should be applied consistently without regard to building type. That was another essential theme that we discussed at that meeting in Rome, everyone agreed, ironically, there were very few situations when all of the 11 experts agreed on recommendations or discussion points. This was one of

2004 Australian National Plumbing Forum

the core beliefs from everyone's perspective that certainly the SARS virus can occur outside residential occupancies. Two very important documents came out of that informal consultation and they came as a result of the WPC's involvement at that meeting. The first was a press release, which we will talk about in a moment; the press release was released on September 26th of 2003 the day after the consultation concluded. The release was drafted on the afternoon of the third day, and of course the Plumbing Industry had a major involvement in drafting that release.

The second document that was released after about four months, it was released I believe in the later part of December or early January 2004. A six or seven page consensus statement resulted from the discussions and recommendations that came out of the informal consultation. That consensus statement is critically important to our Industry because you will see when you read the consensus statement towards the sixth or seventh page there are a number of recommendations and they are directly targeted at the plumbing industry or to the benefit of the plumbing industry they focus on the importance of training.

Having a skilled workforce, things that we have talked about for the past decade or more. We certainly had a major discussion about them on Thursday at the WPC meeting. That there be good and up to date codes of practice, that products be evaluated and tested to verify compliance with National or International performance standards. That systems be inspected by third parties, that there not be unapproved products or techniques used in plumbing or mechanical systems. These are some of the central themes that are contained in that WHO consensus statement. The WHO press release and the WHO consensus statement are both available on the World Plumbing Council website. They are easily downloadable, pdf format and I surely encourage you to download those documents because they can be used in the political forum to convey the message, an independent message from WHO that validates all the things that we feel are central to the future of our Industry in protecting public health. So the WHO consultation consensus statement indicated the global epidemic was estimated to have resulted in just over 8,000 cases of clinical illness over, just over 8,000 cases as of December 2003. There were over 800 deaths at that time, throughout the world and there were individuals infected in 27 countries on 6 continents. So earlier we talked about the fact that there were 6 countries, on 3 continents we can see that it spread further from April of 03 to December of 03. WHO's analysis of the virus transmission indicated that once established in human populations SARS CoV is spread by symptomatic persons in faeces, vomit, respiratory secretions and urine. We now know that these are the three mechanisms or transmission paths by which the SARS CoV virus is spread: Faeces; vomit; respiratory secretions; and urine. And we are going to see that in the vast majority of cases, that transmission occurs in very short distance less than one meter. The only major exception to that was Amoy Gardens where the transmission occurred from building to building. And that is directly again attributable to the fact of those overpowered exhaust fans, the chimney effect that was present in the re-entrance space and the prevailing winds that were existent on those 10 days or so in late March of 03. WHO the medical community has determined that virus shedding peaks between the 7th and 10th days after the onset of symptoms so that is the peak of the virus, between the 7th and 10th day. Disease transmission during the epidemics has been overwhelmingly across short distances less than a meter as I indicated. As I further indicated at first at the Amoy Gardens it was 10 of meters but that was because again primarily because of ventilation or improper ventilation and air currents. An analysis of the virus transmission water shields in toilets and other fixtures are highly effective but leaks enabling droplets to escape may occur in pipes routing through

buildings and from vent stacks without evidence of leakage and are a matter of concern. Again what I am reading to you and what I am going to continue to read to you is in the WHO consensus statement. And the essential themes to what it is we do, on a daily basis whenever possible venting-systems should be free of mechanical devices. This came from us and it resulted when there was lengthy debate about concern with virus transmission through vent pipes or through other devices that may not properly function. Again we remember with the Amoy Gardens outbreak, the virus came through an unprotected trap seal through cracked soil lines. So the WHO experts at that meeting concluded that it makes sense whenever possible not to have mechanical devices installed in venting systems. I'll leave it there. Further analysing the virus transmission removal of potentially virus containing droplets from the built environment must be accompanied by measures to ensure that the exhausted droplets are not then reintroduced to the built environment. What we are talking about here is vent terminus. Some of the codes, certainly our code in the United States requires that there be at least a ten foot horizontal separation and at least two feet vertically above any window or opening into living space from a vent terminus. That is to keep air currents from pushing the exhausted air back into the living space. The WHO further concluded that they are not sure if that or those distances are adequate and they have identified this part or this portion of the codes of practice for further research. And that is being discussed as we speak. This phenomenon certainly appears to have played a critical role in the Amoy Gardens outbreak. There were photographs taken of some of the vent terminus exiting the Amoy Gardens, some of them were particularly on the upper floors, were right outside the bathroom windows. So when they saw that and realised, and were able to conclude and validate that the virus transmission occurred from the plumbing system, there were vent terminus occurring right outside bathroom windows in those re-entrance spaces. So that was another area of significant focus.

There is generally little evidence, thus this area has been identified as a research priority as I just mentioned, WHO has said to the plumbing industry we need to do further research in determining what vent terminus, what problems can occur if vent terminus are too close to living space. And we are getting close to the end so just bear with me. Settings in which controlled measures are needed and again this is as of the end of 2003, of course health care, including residential care, multi-storeyed residential accommodations, settings where people congregate, and other multi-storeyed settings. The press release, which was the first document that I referred to earlier, was released as I said earlier on the 21st of September 2003. Again the press release and the consensus statement from WHO are available on the WPC website. The title to that press release is Inadequate Plumbing Systems Likely Contributed to SARS Transmission. That is WHO's position. Inadequate Plumbing Systems Likely Contributed to SARS Transmission. And then throughout the Press Release, these are further extracts, it, meaning inadequate plumbing also contributes to the spread of a number of other infectious diseases in several other countries. Meeting in Rome an International Group of WHO experts review the transmission risks related to the current state of plumbing systems around the world. And how construction and maintenance practices could contribute to the spread of SARS. Fortunately, solutions are simple and already in place in most areas worldwide. But there remain places where short cuts in design, construction and maintenance continue to compromise safety. I mean these are things that we have known for a long time. The consultation emphasised that the solution, proper plumbing, is a simple public health measure, which is often overlooked, but can be addressed at minimal cost. Nevertheless it is a significant tool in stopping faecal droplet transmission of disease and made very, very powerful statements in

2004 Australian National Plumbing Forum

support of what we do. And we need to get this message out. The experts came from 9 countries and represented the fields of epidemiology, virology, environmental health, risk assessment and risk management, building design and for the first time the Plumbing Industry. Just to conclude with a couple of more slides, after the WHO informal consultation in Rome, in September of 03, I mention again that there were two documents that came out of that the press release, and a WHO consensus statement. The World Plumbing Council recognised the need and the value of conducting our own SARS Symposium. So we scheduled a Symposium on the 11th and 12th of February in Los Angeles California and we brought the best and brightest minds of the Plumbing Industry together for the purpose of bringing the best and the brightest minds of the Plumbing Industry to review the SARS XXXX virus outbreak information to receive information based on the experience contained in the Plumbing Industry, and to formulate recommendations in the form of a consensus statement. So there are two consensus statements, there is the WHO consensus statement and then there is the World Plumbing Council consensus statement. All of the documents that I have referred to today, are available on the World Plumbing Council website www.worldplumbing.org. The work product, we produced a consensus statement we have loaded all of the papers that were presented during that two days in Los Angeles, we published a four DVD set that contains the majority of what took place over the course of the two days. We did this because, although the symposium was well attended, there were certainly many people that could not have gotten there, particularly from Hong Kong and China. Because we put the symposium together very, very quickly they weren't able to get visas into the United States. So we published this video in fact Sid Solper and Tim Brink are here both from the National Inspection Testing and Certification Corporation they have a filming division and they donated the filming of the symposium and it is contained on this four DVD set. \$35 US and you can get it on the World Plumbing Council Website. So go there if you want to learn about what took place and what recommendations were discussed and problems that were discussed over the two days of that Symposium. Of course one of the values of what we are doing today over the past few days and being together in Los Angeles was to develop and build relationships for the future and lastly to develop concepts for protecting public health and safety for years to come. As I am very, very happy to have the pleasure of conveying this information to you, I would like to point out a couple of other things if I may. The World Plumbing Council is very, very active in trying to convey information about what we do. One of the best mechanisms that we have is known as people and plumbing. This is one of the informational pieces that try to explain to the public at large what the plumbing industry does and what we contribute to society. Again this is available, you can go on the World Plumbing Council Website, and the World Plumbing Council publishes a newsletter, about every four months, we are now making it available on the World Plumbing Council website in digital format. So members of the WPC can download it, you can print your own copies, we respectfully request that you distribute it to your members. We need to get information out about what WPC does and what the World Plumbing Industry needs to do together because we have so much more to do. Now I think Steve with your concurrence I'll stop there and if there are any questions I will be most pleased to respond. So thank you very much.

Q. When considering, you brought up a few times there regarding world standards, and quality tradespersons etc, one of the points I took a note of while you were discussing that was in the US some 10 years ago, California in particular were heading down deregulation path, as far as trades peoples goes, my question to you is has California or

the US found that deregulation path has worked, and if not, what is the US or California doing about it.

R.1 Okay thank you for that. I have got a couple of colleagues from California that I introduced earlier that may be able to help.

R.2 Well there is in the City of Los Angeles and the county of Los Angeles there is plumbing licensing, in some of the outlying areas they, because of cost and some other things have looked to diminish that licensing procedure, but the deregulation, the only deregulation I know of in the State had to do with electrical deregulation in trying to get cheaper energy provided to the participants or the...

R.3 You are talking about the utilities in other words.

R.4 Yes the utility of deregulation but it didn't have to do with plumbing. But we still on a level when they turn out of an apprenticeship programme have to meet a mandatory examination; we also have a certification process that gives them entitlement to certain procedures by virtue of their certifications.

R.5 So I think we have got a very strong, in California a very strong regulatory system, with regard to regulating the plumbing industry. That is not the case in many other States because we do not have a National System of either code regulation or contractor, apprentice, journeyman regulation it is typically done at the State or in some places at the local level. Tim did you want to add something?

R.6 Yes as far as code enforcement goes California adopts a State code for plumbing which right now the uniform plumbing code developed by IAPMO and most States either State-wide adopt a code which is amended by the Local jurisdictions or the Local jurisdictions adopt a code. So there are typically two codes that are enforced across the country the IAPMO code the uniform plumbing code and the International Plumbing Code. So as far as the plumbing goes in California it is still highly regulated on a statewide basis.

R.7 and codes are in place in most States throughout the US.

Questioner: Yes it wasn't so much the codes it was more the labour market that was, some ten years ago I know a lot of Western Countries were heading down that deregulation path, and I did a trip with an Australian group to California and we went to some sites in San Francisco and one of the contractors that we spoke to a plumbing contractor from San Francisco that had the contract made the comment to us that since deregulation had come in of the labour market it was fantastic because you could use the cheap Mexican labour. And the standards were dropping off dramatically so although he was getting cheaper labour the standards were dropping off and I know World wide there seems to be a move back to more regulation. And I was wondering whether or not this particular case had ever come up in San Francisco. Maybe I am

wrong but I know we asked this particular contractor the question, because Australia was also contemplating going down the deregulation path on the labour market for plumbing, in other words no regulations on plumbing contractors.

R. You are true in the fact that there used to be I mean up until the late 70's licenser of installers in other words the plumbers in the field used to be directly related to I mean you had to have that license to actually work in that trade. In the metropolitan area like I said in Los Angeles, Los Angeles county which you know is better than half the population of the State, that is still true. But in some of the outlying areas they have diminished the licenser procedure for installers. Now there is no change in a licenser procedure for the contractors and that is still in place, and the codes are still in place. And the codes are to be enforced of course by inspection, but the problems are and I mean lets be honest about it in the world economy everybody sees and we talked about that earlier when there are no problems nobody dies from anything in the plumbing system anybody can put it in and that is what most of the public believes. So when they see a fee to be somewhat onerous when they take out a building permit it may help to create a cost of providing licensure to the installers, they see that as an extra layer of cost that are burdensome on the home owner which, what we look at today that is probably not true it is probably money well spent. But those things have driven, licensure in some remote areas away from the different policies that is true. It used to be a lot tighter up until about I am going to say the beginning of the late 70's early 80's.

In the UK the Secretary of the World Plumbing Council constantly tells us how frustrated the Institute of Plumbing is there because they can't get a licensing scheme in place. So I think there are examples where there are good regulatory schemes in place and then there is many other examples where there is complete frustration from the Plumbing Industry. From the United States perspective, particularly from California's perspective I don't think we have any problems with the regulatory scheme or the codes; I like to believe they are world class, and it becomes a matter of enforcement I believe is the bigger problem from my perspective.

Questioner: With regulation of course is the standards are maintained. That is the most important thing. And I know the UK had a similar problem. They are talking about trying to get back into regulation and we have discussed both locally and nationally in Australia and regulation is the path that we say we want to head back down rather than deregulation which was all the talk some 10 years ago. Anyway that is enough for me. Thanks very much.

Well done, thank you.

Question: Yes Russ, going back to the SARS problem, the index patient was it ever found out how he contracted the virus?

Yes, it is believed, I didn't mention thank you for allowing me to explain that the latest information that I had is that the virus originated in animals, in farm animals, and the

doctor apparently treated a farmer who I believe was the one who conveyed, transmitted the disease from his farm animals to the doctor. Now I am embarrassed to tell you I don't know what happened to the farmer but I know that WHO's information the latest was that it was believed to have originated in farm animals.

Question: Russ, thank you for a very enlightening discussion this morning, the point that I would like to make as a Sydney member of the Institute of Plumbing relates to floor drains which we tend to have as a standard requirement in our bathrooms which the WPC is recommending against, I guess we look at that as a safety item so my first question would be does the basin and bath always have a inbuilt in overflow system to overcome that, the safety point of water leakage or overflowing primarily and have you found that the other point that was there about charging for uncharged floor waste whereas we normally do run either a bath or a basin through to keep them charged. The problem that we do find is that in laundries while the Australian Standards allows that our local governing authority does not allow the laundry tub to charge it. Now there are these water-charging valves that are available only from the States and have you found them successful and have you had any problem with those?

Well the first question with regard to overflows and I can speak to only the areas where codes are adopted which are throughout the majority of the US and Vietnam the Philippines some of the other foreign countries our code contains performance product standards, that contain performance requirements. One of those requirements is that fixtures be provided with an overflow so that there is a mechanism that would prevent the overflowing of the fixture onto the floor. With regard to trap primers or the importance of maintaining the trap seal when I was in the plumbing business for 15 years I installed many a trap primer. I never ironically and I don't know whether it was because of the type of work I did or some other reason but I never dumped a fixture over a floor drain trap I always used trap primers but however you do it, I guess the important thing is that we provide a mechanism for automatic trap seal protection and not rely on the maintenance people to dump water into the trap or whatever now there are certainly situations where there is freezing concerns, things of that nature that certainly need to be considered but we have learned from SARS and we don't know how many times in the past something may have occurred because of a pathway that resulted from an improperly protected trap seal. I hope that was what you were asking. Thank you.