



Fire Services in Germany, Queensland & New South Wales

Experiences from 4 months in Australia

Prepared by

Adrian Ridder, B.Sc.

Fire Safety Engineer

Bergische Universität Wuppertal/Germany

Prepared for

Queensland Fire Rescue Service

Brisbane Region

March 2011

Contents

Executive Summary	4
Introduction.....	5
Timeline	5
Comparison of Countries.....	6
Staffing	6
Organization	6
Advantages of a state fire service	7
Major Infrastructures	7
Staff	7
Training.....	8
Live Fire Training	8
Information Management System	8
Command and Control	9
AIIMS	9
Incident Command Vehicles.....	10
Command facilities	10
Command Training	11
FireCom/Comms.....	11
ROCC/SOCC.....	11
Hazmat	11
Scientific Branch	12
WH&S	12
Senior Officers	13
Additional Capabilities FRNSW.....	13
Fire Research & K9	14
Fire Safety.....	14
Rosters.....	15
Aerial Appliances.....	15
Fire Trucks	15
Ambulance/First Responder.....	15
Unwanted Alarms.....	16
Key depot	16
AirOps.....	16

March 2011

Non-turnout work	16
Special Ops	16
Controlling Agency	17
Station Wear.....	17
Wages.....	17

March 2011

Executive Summary

During my 4 months in Australia, I had plenty of opportunities to compare the Fire Services in Queensland and New South Wales to their German counterpart.

While there are big differences that result from different population densities, building characteristics and similar influences, I like to say that in the end there are only minor differences in how the core business of delivering service to the citizens are conducted.

I saw many good ideas and concepts that challenged my hitherto believes and hope that some of the “German way” of fire service work described below can achieve the same for Australian readers.

In general, I believe the fire services I visited are one of the best I have ever seen, meaning they are among the best in the world and cutting edge in many ways. In many aspects, German fire services can learn a lot from Australia, both on their own individual work and the overarching organization of state emergency services.

March 2011

Introduction

As part of my final year studying Fire Safety Engineering at the Bergische Universität Wuppertal in Germany, it is mandatory to spend a practical term of 12 weeks in a work environment close to Fire Safety Engineering.

Through personal contacts to SO Shan Raffel (Queensland Fire Rescue Service) and Insp John McDonough (Fire Rescue New South Wales), the idea was born to spend this time overseas, working with both QFRS and FRNSW. Made possible by the assistance of the Institution of Fire Engineers (IFE) Australia and the support of AC Ian Mitchell (QFRS) and Supt Chris Jurgeit (FRNSW), I finally arrived in Brisbane on the 18 November 2010 and started my practical term in Australia.

I want to thank all of the gentlemen mentioned above very much, as this eye-opening, informative and certainly also personally transformative stay would not have been possible without their continued support. Especially the continuous support of my friend Shan Raffel, who took on the certainly sometimes challenging task of being my liaison officer during the whole stay, was invaluable. I would also like to express my gratitude to everyone I met and dealt with during my stay; everybody was very helpful, caring and I made many new friends. Thank you.

To give at least something back to the organization, it was my pleasure to prepare this report that reflects my findings in how different (or similar) the fire services operate in Germany, Queensland and New South Wales. On the following pages, my personal impressions on different aspects of the work of emergency services are stated.

The first very positive fact I came across was in my first days with QFRS at a meeting with AC Ian Mitchell. Although I had done similar placements with German Fire Brigades, I had never before encountered such a willingness to accept feedback even from a student. That alone is proof for a very healthy business culture and an eagerness in continuous improvement.

Timeline

I worked with the QFRS from November 2010 to January 2011. That totals to 8 weeks of operational experience. During my stay, I visited several day work units as well as QCESA, interviewed the staff there and was introduced to their work. In addition, I worked 7 full tours on C-Shift at Kemp Place Station, which gave me good insight in the operational side of work.

During the 2010/2011 floods, I worked with the Rapid Damage Assessment Teams and the BA Hazmat/Scientific teams that ensured air quality in flood affected buildings. On a more strategic level, I visited and worked at the ICC Kemp Place, the ROCC and SOCC, which gave me valuable experiences in all different levels of command.

In January and February 2011 I spent 4 weeks at Fire Rescue New South Wales (FRNSW, ex NSW Fire Brigades), visited again several day work units and State Training College and did two night shifts at City of Sydney Station.

Comparison of Countries

Comparing Germany to Australian states, the huge differences in area and population density catch the eye: QLD is almost 5 times as big as Germany with a population of 4.4 Mio, leading to a population density of 2.42 p/km². NSW is more than double the size of Germany with 7 Mio people and 8.90 p/km². Germany, by comparison, is inhabited by 82 Mio people resulting in as many as 229 p/km².

Those differences are reflected in the number of staff, too. As QFRS employs ca. 2000 permanents, 2000 auxiliaries and directs ca. 35,000 rural volunteers, NSW has some 6900 permanents & retained as well as 70 000 rurals, Germany has roughly 30 000 permanent firies and as many as 500 000 active volunteer firefighters. In my opinion, those differences in numbers are made up with in the quality of training. It is also interesting that because of demographic changes and an ageing workforce, the German Fire Services very probably have to adapt something more similar to the Australian concept in the years to come as we simply won't have the big number of staff anymore.

As the floods unfolded, it got the impression that the relatively small number of firefighters, although complemented by SES, SLS and other staff, was stretched to the very limit and it would have been interesting for how long a full blown recovery effort, as it was executed during the first 2 weeks of the Brisbane floods, could have been sustained.

Staffing

The biggest operational difference between Australia and Germany is probably the crew size and the amount of manpower dispatched in general. The „traditional“ crew size in Germany is an officer and eight men (1/8), which today is down in many permanent brigades because of cost savings to (1/5). And this is with a standard response to every fire alarm of two pumps and an aerial ladder (or heavy rescue or water tender depending on the type of emergency). On example was an UWA at a hospital: QFRS' response were 2 pumps, back home probably at least double that would have arrived.

In addition, traditionally German fire services have not as many stations, but bigger ones. However, lately there is a trend towards more and smaller stations in some services in Germany.

Organization

Talking about the organization of fire services in Germany, another profound difference comes to light: Every city and even small town has its own independent fire brigade, funded by the city. That leads to the huge number of ca. 25 000 brigades in all of Germany. That leads to big differences in training, equipment and tactics. National standards on basic equipment such as hoses and radios ensure interoperability. In my opinion, a state Fire Service as QFRS is far superior in delivering its services. From the two state fire services I visited, my impression is that QLD has the better system as the rural fire service is included and the overarching division of responsibilities between the different emergency services seems in order.

In opposition to that, FRNSW's relationship with its RFS is problematic and fraught with infighting and mistrust. In addition, even police, ambulance, SES have rescue units in NSW, which causes unnecessary friction and turf fights.

Advantages of a state fire service

The upsides of a uniform state fire service are quite obvious: A great deal of standardization in equipment, training, tactics and nomenclature can be achieved while still allowing enough flexibility for local needs. That standardization is especially useful at major incidents and catastrophic events, as though that equal units are created whose value and capability is well known to ICs, even when the units are deployed from far away in the state.

Another big plus is in my eyes the access to other governmental departments and agencies at eye-level; on example from the flood operations was the delivery of 30 SUVs for interstate USAR-Teams by QFleet.

Furthermore, by forming a state fire service a „critical mass“ is reached which allows for operating units like GIS, inhouse-IT, Scientific Branch, own workshops, and technical services, which would not be possible for small, city-based brigades.

Having a state fire service also allows for a more “scientific” approach in testing new equipment and methods: One project of testing can be conducted and its findings rolled out to the whole state (a good example for that is the CAFS trial), instead of reinventing the wheel all the time.

Major Infrastructures

At QFRS, acting positions and/or DMOs (changing persons depending on shifts) are tasked with covering construction and operation of major infrastructures. To improve handling those projects, a dedicated position of a “Manager Major Infrastructure Construction & Operations” could be helpful. At FRNSW, the Structural Fire Safety Unit covers all life-cycles of major infrastructure from design to operation, this could also be a interesting role model.

Staff

The concept of “acting” positions provides an excellent opportunity to experience different areas (e.g. BAO, DMO) before deciding for permanent career and for staff to be “in the shoes” of their bosses.

However, some mechanism seems necessary for retaining the knowledge and to involve the general staff in the specific project topic (examples: OpsDoc, Tunnels, ECC/eIAP) to avoid that the acting positions are the only stakeholders in the project, without the support of “regular” branches. This could be a problem when the temporary acting position is dissolved and therefore much knowledge could be lost and an often needed consolidation phase not fully completed.

Training

QCESA offers outstanding training capacities for a wide range of different aspects of fire service works and is definitely a role model for many fire colleges around the world. However, I learned that access to the facilities is very limited and little to no regional training facilities exist.

Especially the long distances many participants of courses have to travel seem to hinder continuous professional development. For comparison, the German state of Bavaria with only 1/25th of Queensland's area (and 12 Mio inhabitants) has 3 Fire Colleges to offer regional training.

What I have seen of the NSW State Training College is by far not comparable to the possibilities at QCESA, mainly because of the inner city location of STC (more or less lesson rooms and some BA facilities only).

What I liked very much is the effort of continuous education and training, as done with the Core Skills Program and continuous Refresher Courses even for Senior Officers. Beside its good intention, the CORE is obviously not really accepted by crews and often seen only as a legal tool of fulfilling obligations and not really improving the knowledge of crews. More hands-on-training and less theoretical lessons (one recent example: "Discuss your understanding of the QFRS service fundamentals") could maybe part of the solution.

Live Fire Training

FRSNW has an outstanding live fire training program that is scientifically founded and top-of-the art. The main focus of the program is on carbonaceous training as that is what resembles interior fire attack conditions.

Two different levels of live fire training courses have been developed pushing the envelope of latest knowledge in different modes of extinguishing and safe-zoning techniques.

There are several regional live fire training centers covering the whole state and enabling all staff (permanents and retained) to receive live fire training. There are regular refresher courses with the aim of getting every staff through live fire training once a year.

Information Management System

QFRS Information Management System has a clear separation between operational information, business rules and standing orders. It is the best system of that kind I have encountered so far. The clear distinction enables the user to find necessary information immediately which is the sole purpose of such a system. The whole system of the uniform OpsDocs are in my opinion also a valuable tool in assuring the quality of work of units across the state and providing an uniform approach to similar problems.

FRNSW has a similar system, which however in my opinion is not as stringent.

March 2011

Command and Control

The command structures on all levels (local, regional, state) are very clear and good. A big advantage on behalf of QFRS is in my opinion the corresponding system of QFRS control centers (ICC, ROCC, SOCC) to disaster management structures (LDMC, DDMC, SDMC).

Impressive was the capability to quickly set up ICCs at stations (e.g. Kemp Place) by using training rooms and pre-deployed radios etc.

In general, QFRS' ability to command and control big scale operations were very impressive; the typical German City Fire Brigade does normally not prepare to control more than say 200 units which becomes a serious problem in incidents covering large areas.

The various tools that support Command & Control such as the eIAP, TOM and purpose made GIS maps are extremely valuable tools, especially as they can be adapted as needed even during incidents as I have witnessed during the floods.

AIIMS

The AIIMS-system works well for incidents of longer durations as floods. Germany uses a similar approach with slightly different areas of responsibility: Instead of the three functions Planning, Logistics and Operations the German system called "DV 100" names six different functions (which not always have to be manned). They are numbered from S1 to S6 and cover the areas of Personnel, Information Gathering and Assessment, Operations, Logistics, Media & Press and Communications.

I could not say that one system is better than the other; what I noticed is that both systems work well and it is easy to blend into the other if you know one.

Incident Command Vehicles

Tango is definitely an exquisite piece of equipment and I would be hard pressed to find German ICVs that have any more functions.

FRNSW uses two identical busses as ICV for redundancy reasons and to be able to cover multiple incidents or incidents that cover a huge area. Despite of being a couple of years old, FRNSW ICV have been continuously updated and therefore still up-to-date, except that they don't have a satellite link.



1: FRNSW Incident Command Vehicle

Command facilities

The Major Incident Control Center (MICC) of FRNSW doesn't have the same possibilities in terms of technology, FireCom operator etc. than the ROCC, let alone the SOCC

The Rural Fire Service NSW has an impressive, quite new Headquarter, but FRNSW has only a liaison role there.



2: RFS NSW Headquarter

March 2011

Command Training

FRNSW has embraced the means of virtual command training using simulation based incidents („BlueCard Command“). In my opinion, that training method is very valuable and can be used for all levels from Station Officer up.

I have been informed that many users there not satisfied with the Vector software anymore and search for different VirtualReality software, as is QFRS.

FireCom/Comms

The systems and procedures used at dispatch centers are very similar to Germany. However, in Germany there is currently a push to form so called “integrated dispatch centers” to cover fire brigades and ambulances.

FRNSW uses uniformed firefighters as Firecom Admins (like Germany), but in my opinion specialized staff are more suitable for that task as that work requires a different set of skills than firefighting. In addition, training a fire to SO and paramedic (as done in Germany) and then “wasting” him in a dispatch center doesn’t really make sense to me.

ROCC/SOCC

During the floods we realized that an automated overview of units that have been dispatched or still in-quarters units would be desirable; we had to count them by hand which is quite prone to failure.

In general the concept of having additional admins to support officers seems very valuable to me and keeps a lot of work away from uniformed officers by which they have more time to focus on their primary responsibilities.

The usual glitches of command work (e.g. loss of information between ROCC and ICC) cannot be totally avoided but have by my account been reduced to a minimum.

Hazmat

As far as I have seen, both QFRS and FRNSW have similar good capabilities in terms of detection, decontamination and handling of hazmat incidents.

FRNSW has its specialized HazMat units stationed at 3 different specialized Hazmat stations throughout the GSA.

Bot QFRS and FRSNW follow a similar approach with a Scientific Branch /Advisors. However, in NSW there are only 2 Scientific Advisors in the whole state and no volunteers to support permanent staff. QFRS’ concept appears to be superior here.

Scientific Branch

The Scientific Branch is very valuable as “connection” between industry/science and fire rescue work. To have scientific experts who also are familiar with the operational needs of fire brigades cannot be valued highly enough. Moreover, it seems that the research carried out by Scientific Branch can be of great use for QFRS.

In Germany, the chemical industry provides support by their own specialized industrial fire brigades and experts that can be requested by municipal fire brigades either for advice or full blown operational support (that system is called TUIS).

A possible future additional useful capability could be medium-range mobile CBRNE reconnaissance as currently used in Germany.

The federal government of Germany provided many departments with recon vehicles with specialized equipment for Chemical, Radiological and Nuclear (as well as limited Biological) detection capabilities. The equipment includes NBR radiation counter, a specialized IMS and PID as well as a GPS and data remote transmission system for instant mapping of detected hazards.



3: CBRNE recon vehicle and removable detection equipment

WH&S

As I have been trained as a Safety Engineer, I noticed some inconsistencies in WH&S: On the one hand, actual practical training lessons are delivered how to step off the truck, on the other hand things like very heavy high-rise pack, very heavy hoses and couplings, refilling foam on trucks and other ergonomically challenging things are not addressed at all.

At FRNSW, uniformed officers are trained and responsible for Safety what maybe clarifies operational needs more.

March 2011

Senior Officers

I noticed a quite big “chasm” between senior officers on the one hand and SO/Fire level on the other, although all seniors have risen through the ranks. Something similar is not known in German fire services although we have lateral entry.

A model used in Germany and NSW could maybe help to close that perceived gap: more seniors as “Duty” and “Zone Commanders” on 10/14 (compared to only DMO). That would also deliver a level of control and support for SOs at medium-sized incidents.

Additional Capabilities FRNSW

An asset unknown to QFRS is a helicopter that FRNSW co-owns together with NSW Police. It is used to transport IMTs, HazMat equipment etc.



4: NSW Fire Rescue & Police Helicopter

Fire Research & K9

FRNSW operates a Fire Investigation and Research Unit that not only investigates fires, prepares statistics, but is also involved in actual research in fire behavior, burning characteristics of equipment etc. pp.

FIRU also has a canine detection unit, which is obviously far superior to any monitoring equipment.



5: Research of FIRU and the K9 Unit in action

Fire Safety

The work of the fire safety units in Australia is quite similar to Germany, although in some areas the QFRS and FRNSW units have more responsibilities and rights than just to deliver comments.

From the BAOs at QFRS I often heard the need for more staff and that they are severely overwhelmed by the workload. They seem to be well prepared for their task.

At the Structural Fire Safety Unit of FRNSW, Fire Safety Officers don't receive formal training that would qualify them for the task at hand. As I have been told by them, they are the only unit in Australia that is in that situation. There is some planning going on for FRNSW to pay for fire safety engineering studies at University of Western Sydney, but for now the covering of costs is still unresolved. Over the years, the officers make up for the lack in training by experience and "on the job training".

At SFSU, 4 Fire Engineers are employed full-time to assess alternative solutions.

March 2011

Rosters

FRNSW uses the same 10/14 roster for shift work as QFRS. At Fire Safety, an in my opinion interesting day work roster is utilized, to give operational staff an incentive to switch to day work: 4 days on with 10.5 hrs each, 4 days off, 2 platoons to cover whole week.

I like that roster very much, but it would not be legal in Germany: After having 24 hrs rosters for a long time, EU regulations mandate that only 12 hours can be worked in a row. Currently, different experiments are going on in different brigades to find a new suitable roster.

Aerial Appliances

Both FRNSW and QFRS use far less aerial appliances than we in Germany; probably in large parts because of different building characteristics life rescues are not that big an issue.

Germany uses Brontos only as special aerial appliances; aerial ladders are mandatory for life rescue as they are faster in jacking up and moving, are lighter and smaller to fit in building code prescribed ladder spots.

FRNSW looks again into buying ladders for those reasons, too.

Fire Trucks

The modern QFRS and FRNSW trucks are more or less the same than their German counterparts, with bigger pump capacities

In Germany all the planning is done by the coach builder in accordance with detailed standards for individual types of pumpers and other vehicles.

Most small departments don't have a technical department which could do the planning, so outsourcing it to the manufacturer makes sense. The downside can be that the manufacturer plans what he wants to sell and not what suits your needs best.

Ambulance/First Responder

Unlike Australia, in Germany most permanent brigades deliver ambulance services, too. In my opinion, that leads to a problem with cross-training, as totally different skills have to be maintained and kept up-to-date. A good solution in my eyes would be to merge fire & ambulance under one command but with different staff for the two branches. The advantage of that would be that tactics and equipment would be uniform and tailor made for each other, while the staff would not have to be cross-trained.

FRNSW is embracing the concept of first responding as another way of staying relevant.

March 2011

Unwanted Alarms

FRSNW and especially the City of Sydney Station has similar problems as 1 and 2 Stn of QFRS with automatic alarms.

In Germany we also have our fair share of unwanted alarms, but not to the extent I witnessed in Australia. As I couldn't figure out other reasons, maybe improvements in the standards for wiring and installation of smoke detectors and fire indicator panels would help.

Key depot

In Germany the Fire Service has one standardized key to open a key depot at the object of an automatic fire alarm, which is activated when the alarm goes off.

In the depot is a master key, swipe card etc. for the whole building. So you don't have to have individual keys and stations can also respond in other areas.

AirOps

To learn about the Air Operations at QFRS was very interesting and impressive. Unfortunately I cannot compare their work to FRNSW, as Air Operations there is the responsibility of NSW RFS.

The Germany fire services only slowly develop tactics and strategies for wildfires as we experience a rising number of them, probably because of climate change. In Germany police and air force helicopters are used for fire attack; the problem with that is, that because of the many different fire services no uniform training for ground crews is available, which would be desirable for easy interaction with the flight crews.

Non-turnout work

Interesting to see was the involvement of operational crews in non-turnout work like creating and updating LAPs, inspections, visits to Children's Hospital and homes etc.

That kind of outreach to the community is not really standard in Germany and in my opinion desirable. Reaching out is for the image and public perception of QFRS definitely better than "hiding" in the stations.

Special Ops

The work of the Special Operations Command and especially the USAR capabilities were very impressive. That again is an advantage of a state fire service: A small municipal fire brigade could not afford to have a full USAR team for international deployment.

The creation of Special Ops to me is also an expression of the realization, that specialized work needs specialized training. Unfortunately, that perception is not widely known in Germany and almost all fire services there still cross-train in every "profession" or when they have specially trained staff still have them on the trucks and not in dedicated units (with some exceptions like divers and high-angle rescue).

March 2011

Controlling Agency

In Germany, all non-crime related operations are the responsibility of the Fire Service. That is why I was pretty surprised to learn that in Australia normally the Police have the lead. Both approaches seem to work well.

However, the Police being the controlling agency I would have expected more preparation in terms of command facilities, radio links etc. on their part. As I witnessed as assistant liaison officer at Mt. Ommaney during the floods, there were almost no preparations for controlling bigger incidents and we worked out of a normal office environment.

Station Wear

FRNSW issues more casual work uniforms („blues“) to operational staff which are apparently more comfortable and easier to wear and clean. I was surprised to learn that QFRS crews have to wear buttoned shirts for everyday turnout; every other department I have got to know has changed to T-shirts, polo-shirts or more casual shirts.

Wages

I was surprised to learn about the comparatively high wages fireies are paid in Australia. I found out, that in Queensland a firefighter after his first year out of college earns more money than a German officer having the equivalent rank of Inspector. It should be noted that reaching the rank of Inspector in Germany typically requires 5 years of university studies (no pay) and another 2 years of officer training (very low wages).