Reason and Practicability in Managing Chemical Hazards

Michelle Kiernan and Ian de Stigter

SUMMARY

Data collected through an on-line survey of NZ school science technicians established that one quarter of schools have not made (chemical hazard) Laboratory Manager (LM) appointments. LMs are more common in larger schools, and in independent schools, and there is a pronounced regional variation. While a few LMs seem to be appropriately paid and allocated time to fulfill their role, many receive little time or money, and most get none of either. It is therefore not surprising to find that hazard management achievements are relatively modest. ERO and the Ministry of Education have given less support for chemical hazard management than would be expected. Key changes are consequentially proposed as necessary in schools with the new hazardous substances management regime to be introduced under the Health and Safety at Work Act 2015.

Table of Contents

Reason and Practicability in Managing Chemical Hazards

Michelle Kiernan and Ian de Stigter

Summary

Data collected through an on-line survey of NZ school science technicians established that one quarter of schools have not made (chemical hazard) Laboratory Manager (LM) appointments. LMs are more common in larger schools, and in independent schools, and there is a pronounced regional variation. While a few LMs seem to be appropriately paid and allocated time to fulfill their role, many receive little time or money, and most get none of either.

It is therefore not surprising to find that hazard management achievements are relatively modest. ERO and the Ministry of Education have given less support for chemical hazard management than would be expected. Key changes are consequentially proposed as necessary in schools with the new hazardous substances management regime to be introduced under the Health and Safety at Work Act 2015.

Introduction

Concern and disappointment have long been expressed that school management of chemical hazards has been less successful than hoped for and expected, and we wanted to collect reliable data for discussion.

A school science technician survey carried out between July and September 2015 gathered information on several topics, but principally appointment of Laboratory Managers to manage chemical hazards, together with safety achievement assessments.

Data collection for the Survey

Chemical hazard management has been a topic of continuing attention for school science technicians, with at least two earlier surveys of Laboratory Manager appointments being carried out. The Science Technicians Association of New Zealand (STANZ), which represents the professional interests of school science technicians, has greatly assisted in this 2015 survey. STANZ executive members Terry Price and David Cook emailed information and reminders to all technicians on the STANZ national database, encouraging them to complete it on-line. We supplemented these efforts with personal emails asking for assistance from science technicians who had not responded to the STANZ mailouts.

We asked in the survey questionnaire whether school Laboratory Managers had been appointed, and whether they were paid for the role and given time to fulfill it. We then asked the technicians to evaluate whether Code of Practice (COP) requirements (under the Hazardous Substances and New Organisms Act) had been met in 12 areas of chemical safety, then asked in summation whether all practicable steps were taken to implement the COP HAZCHEM requirements.

The survey respondents indicated whether their school was Independent, Integrated, or State; whether it had a roll of 1-800, 801-1500, or 1500+, and which of 10 regional groups it belonged to.

Laboratory Manager appointments

The survey produced data from 177 schools, and of these 133 (75%) had appointed Laboratory Managers (LMs) as required by the COP. As expected, larger schools were more likely to make such appointments.

Table 1: Laboratory Managers for schools by school size

School student numbers	Ratio with LMs	% with LMs
1-800 students	69/96	72%
801- 1500 students	45/59	76%
1500+ students	19/22	86%
All schools	133/177	75%

School type also affected whether schools appointed a LM. Independent schools were more likely to have one, while integrated schools could not be distinguished from state schools in appointment rates.

Table 2: Laboratory Managers for schools by school type

School type	Ratio with LMs	% with LMs
Independent	15/17	88%
Integrated	26/35	74%
State	92/125	74%
All schools	133/177	75%

Comparing schools in different parts of the country shows there are obvious differences between regions, although the small number of schools in some regional groups means that their tabled percentage of LMs in schools may be misleading.

Table 3: Laboratory Managers for schools by region

Regional group of schools in survey	Ratio with LMs	% with LMs
Northland	4/5	80%
Auckland	37/49	76%
Waikato	9/16	56%
Bay of Plenty	8/13	62%
Gisborne/Hawkes Bay	9/14	64%
Taranaki/Manawatu/Whanganui	8/9	89%
Wellington	17/20	85%
Nelson/Marlborough/Tasman	6/6	100%
Canterbury/West Coast	20/25	80%
Otago/Southland	15/19	79%
Nation-wide	133/177	75%

A comparison of the job titles of those taking on the LM role shows this information compares well with that obtained in a June 2008 LM survey carried out by Sheryl Fitzsimons of Nelson College for Girls, even though since 2008 more schools have made LM appointments.

Table 4: Roles of Laboratory Managers in 2008 and 2015 surveys

Survey summary data	2008 Lab Managers		2015 Lab Managers	
Head of Science	25/46	(54%)	74/133	(56%)
Head of Chemistry	6/46	(13%)	17/133	(13%)
Chemistry teacher	3/46	(6.5%)	7/133	(5%)
Science teacher	3/46	(6.5%)	10/133	(7.5%)
Science technician	6/46	(13%)	23/133	(17%)
Principal	1/46	(2%)		
DP	1/46	(2%)	1/133	(0.75%)
Safety officer	1/46	(2%)	1/133	(0.75%)
Schools having LMs	46/82	(56%)	133/177	(75%)

The record of compliance with COP requirements, shown below, indicates that many schools still have work to do, particularly with induction training of teachers and consulting Safe Methods of Use (SMUs) before carrying out practicals. (Experienced science technicians can tell tales about experiments which teachers have proposed performing with their classes.)

Table 5: Hazard management achievements reported for schools

Achievement area	Ratio achieved	% achieved
Hazchem labeling: pictograms & hazard statements	143/177	81%
Safety data sheets available in 10 seconds	134/176	76%
Consistent use of eye protection	163/177	92%
Updated chemical inventory available in emergency	155/177	88%
Suitable hazardous chemical storage	160/177	90%
Adequately separated incompatibles	143/177	81%
Hazardous chemicals secured from access	163/176	93%
Fume extraction adequate for exposure limits	137/176	78%
Safe disposal of hazardous waste	169/176	96%
Induction training in chemical safety	47/176	27%
Teachers consult Safe Methods of Use (SMUs)	34/174	20%
School has adopted chem emergency procedures	102/176	58%
All practicable steps taken in COP adoption	142/177	80%

Despite the gaps in safety achievements shown in the table, most of those surveyed still felt that the school had taken all practicable steps for chemical hazard management according to COP requirements. Their assertion about taking practicable steps is looked at more closely in the next table.

Table 6: Schools claims to taking all practicable steps

Achievement area	YES Not achieved	NO Not Achieved
Hazchem pictograms & hazard statements	10/142 (7%)	11/35 (31%)
Safety data sheets available in 10 seconds	28/142 (20%)	14/35 (40%)
Consistent use of eye protection	10/142 (7%)	2/35 (6%)
Chem inventory available in emergency	43/142 (30%)	10/35 (29%)
Suitable hazardous chemical storage	10/142 (7%)	7/35 (20%)
Adequately separated incompatibles	25/142 (18%)	9/35 (26%)
Hazardous chemicals secured from access	11/142 (8%)	2/35 (6%)
Fume extraction adequate for exposure limits	25/142 (18%)	14/35 (40%)
Safe disposal of hazardous waste	6/142 (4%)	2/35 (6%)
Induction training in chemical safety	99/142 (70%)	31/35 (89%)
Teachers consult Safe Methods of Use	110/142 (77%)	33/35 (94%)
School has chem emergency procedures	43/142 (30%)	25/35 (71%)
Appointment of a Laboratory Manager	31/142 (22%)	13/35 (37%)

The schools claimed to have taken all practicable steps (in terms of COP requirements) for hazard management have lower rates of non-achievement than those who admitted they had not. Clearly though, those who claimed that their schools have done all they reasonably can for safety, have missed some important things that might usefully have been done. (For example, appointing a LM.)

Table 7: Achievements in schools with/without Lab Managers

Achievement area	With LM		Without LM	
Hazchem pictograms & hazard statements	111/133	(83%)	32/44	(73%)
Safety data sheets available in 10 seconds	104/133	(78%)	29/44	(66%)
Consistent use of eye protection	124/133	(93%)	39/44	(89%)
Chem inventory available in emergency	118/133	(89%)	37/44	(84%)
Suitable hazardous chemical storage	122/133	(92%)	38/44	(86%)
Adequately separated incompatibles	110/133	(83%)	33/44	(75%)
Hazardous chemicals secured from access	123/133	(92%)	40/44	(91%)
Fume extraction adequate for exposure limits	105/133	(79%)	32/44	(73%)
Safe disposal of hazardous waste	126/133	(95%)	43/44	(98%)
Induction training in chemical safety	36/133	(27%)	11/44	(25%)
Teachers consult Safe Methods of Use	30/133	(23%)	4/44	(9%)
School has chem emergency procedures	80/133	(60%)	22/44	(50%)
Average of these achievement areas	1189/1596	(74.5%)	360/528	(68.2%)

Table 7 compares having a LM with not having one. The differences in safety achievements are not huge. Although it clearly makes a difference to have someone responsible for managing chemical hazards, the effects would have to be regarded as rather disappointing. The data on those appointments are examined further, firstly for teacher LM appointments, and then technician LM appointments.

Table 8: Teacher Lab Manager Rewards

Payment type	Teacher LM numbers	% of teacher LMs
0.5MMA	2/109	2%
1 MMA	8/109	7%
2 MMA	5/109	5%
1 MU	4/109	4%
Undefined	1/109	1%
Don't know	21/109	19%
None	68/109	62%

Table 8 shows that, of all the schools which have appointed LMs, 109 or 82% have a teacher in that position. 2008 survey data established that early teacher LM appointments were made with 1MU ($4000/yr) in payment, but this payment level is now the exception, with 1MMA ($1000/yr) as the median figure for teacher LMs who are paid anything. Ignoring the 21 Don't knows, 77% of teacher appointees (68/88) have this role thrust on them with no payment at all. Since 54 of these are Head of Science and 8 are Head of Chemistry, they already have a heavy load with teaching, curriculum leadership and staff responsibilities - for which they are paid and their performance is reviewed. The extra unpaid responsibility of LM is clearly not important; little can be expected from such bonded labour, and so modest achievements might be expected.

Table 9: Science Technician Lab Manager Rewards

Payment type	Scitech LM numbers	% of scitech LMs
0-50c/hr	2/24	8%
$0.51c - $1.00/hr	2/24	8%
$1.01 – $2.00/hr	2/24	8%
$2.01-2.50/hr	1/24	4%
$2.50 - $3.00/hr	3/24	13%
Not specified	1/24	4%
None	13/24	54%

Table 9 shows that, of schools which have appointed LMs, 24 or 18% have a science technician in that position. The 2008 survey gave few clues what science technicians might get paid, but here $1.00/hr (perhaps $1000 - $1500/yr depending on hours/week and weeks/year worked) is the median figure for science technicians who are paid anything. As would be expected, the better-paid science technician LMs are paid at about the same rate as the 1MU teacher appointments. This level seems suitable for the responsibilities if they are taken seriously and COP compliance is anticipated.

The proportion of science technician appointees paid nothing for assuming the role is lower than for teacher LMs, at 54%, but must still be considered a matter of concern.

Table 10: Teacher Lab Manager Assigned Time

Time provided	Teacher LM numbers	% of teacher LMs
1 paid non-contact/week	11/109	10%
2 paid non-contact/week	2/109	2%
3 paid non-contact/week	1/109	1%
No form class	1/109	1%
Undefined	1/109	1%
Don't know	13/109	12%
None	80/109	73%

In addition to the fact that most schools are not prepared to pay a LM to carry out the role, the data in Table 9 shows that few are prepared to assign time for the purpose. The most generous provided a teacher LM with 3 non-contact hours per week, which seems reasonable to go with a Management Unit level responsibility, but most who received any time allocation got only 1 hour per week. However, (after putting Don't knows aside) 83% of teacher LMs were given no time allowance at all to carry out their function. Analysis of time provision for science technician LMs is more difficult. Some but not all have reported that the time available to carry out the LM role on top of their other duties is very inadequate.

Science Technicians as Lab Managers

In 2007 the COP was gazetted and schools began appointing Lab Managers to manage chemical hazards. When some invited their science technicians to take the responsibility, it proved controversial, not least because one of these invitations was to a technician who was being underpaid by two grades already, and it was not clear what was on offer for others to take on the role. There was a feeling that tokenism was rife. A science technician may well take care of hazard labeling, separate chemicals into hazard classes, offer assistance to teachers with risk assessment for practical classes, and assist in securing hazardous substances. But there were doubts expressed. Michal Stone, a former Head of Science, suggested that State schools were not ready for science technicians to discipline teachers. Training staff in appropriate safety procedures, monitoring compliance, analyzing incident reports, and assuring the BOT that chemical hazard management responsibilities had been met, would be a major step change from the mainly supportive technician roles.

Indeed it must be seen as a significant promotion, not as part of the science technician job description. The fact that more than half of technicians made LM are paid no extra indicates the majority of schools have yet to recognize this. However, the appointment carries with it the authority and responsibility to ensure safe practices, working collaboratively with the Head of Science and science staff to introduce and maintain safety disciplines. It is as logical to fill this role with appropriately trained support staff as to have non-teachers as Finance Managers.

But, given the early doubts about science technicians (rather than teachers) filling the role, how have the science technician appointments compared? Are hazard management achievements in schools with science technician LMs on a par with other schools?

Apart from the technicians, are there obvious differences in the achievements among the groups of teacher appointees made Lab Manager? (Head of Science, Science teacher, Head of Chemistry, Chemistry teacher.) Table 11 below compares the 12 hazard management area achievements considered previously, for schools with different Lab Manager appointments.

Table 11: School achievements for Lab Manager Groups

Achievement area	HOSci	Sci Tchr	HOChem	Chem Tchr	Techn
Hazchem labeling	84%	80%	82%	86%	83%
Safety data sheets	78%	60%	94%	86%	83%
Eye protection	92%	90%	100%	86%	96%
Chemical inventory	88%	70%	94%	86%	100%
Chemical storage	95%	80%	82%	100%	91%
Separated incompatibles	81%	70%	82%	100%	91%
Chemicals secured	92%	100%	88%	86%	96%
Fume extraction	84%	50%	71%	86%	87%
Waste disposal	95%	80%	100%	100%	96%
Induction training	29%	20%	29%	29%	30%
Safe Methods of Use	22%	0%	35%	29%	26%
Emergency procedures	64%	40%	71%	43%	35%
Hazard achievement summary	74% (for 74)	62% (for 10)	77% (for 17)	76% (for 7)	80% (for 23)

The table shows that safety achievements in schools with science technician Lab Managers at least match those for all of the teacher groups. The early reservations expressed about science technician appointments have not been substantiated. However, data suggest those schools who have a Lab Manager classified as a Science teacher might profitably review whether that person is most suitable for the role.

Implementing the Code Of Practice

In January 2007, the Environmental Risk Management Authority (ERMANZ) approved this Schools Exempt Laboratories COP to outline how school staff can meet their hazard management obligations. (In July 2011, ERMANZ become the Environmental Protection Agency, EPA). In theory the COP is "voluntary" but, a realistic evaluation will conclude (as the introduction to the COP puts it) that:

"school personnel are unlikely to have the resources to independently comply with the provisions of the Act and Regulations".

The Ministry of Education stance on this deserves comment: the Ministry has directed schools to adopt the Ministry's Health and Safety COP, a Code of Conduct for appropriate use of the internet, a Code of Ethical Conduct for the use of animals, and a COP for Pastoral Care of International Students, but the Ministry has not obliged schools to adopt this EPA-approved chemical hazard management COP. Schools have not been funded for the considerable wage and training costs of chemical hazard management, or for capital upgrading for suitable chemical storage and fume extraction equipment. It seems the Ministry has not encouraged taking HSNO obligations seriously, because it does not want increased operating cost liabilities and claims for necessary school capital upgrades.

The Education Review Office (ERO) has also been reluctant to engage with school responsibilities for chemicals. Local authorities conducted Dangerous Goods inspections before the HSNO Act in 1996, and these local body inspections were continued under transitional provisions until July 2006, when school compliance was supposedly reviewed by ERO. ERO seemed to be unaware of it.

The June 2008 schools survey by Sheryl Fitzsimons asked whether schools had had ERO reviews. Of 82 schools, 14 reported ERO reviews, but little interest in hazard management. The comments reported from the 14 schools were:

1. *"In 2006, checked I keep technician area secure – almost their final item as they left the school."*
2. *"Last time they were here we hardly saw them."*
3. *"The college had ERO review 2 years ago, nothing about COP or LM."*
4. *"ERO have made comment re chemical safety but have not actually reviewed."*
5. *"ERO reviewed last year. No comment from them re COP."*
6. *"We had an ERO review in Feb and the team leader was a chemistry teacher. She looked at most things and made a few comments on safety issues, but didn't mention the COP."*
7. *"ERO here now. I asked the (ERO) "science chap" about the COP and was shattered to find he did not even know it existed."*
8. *"They wandered through our prep room and labs but made no comment. But we have worked hard to get the signage etc correct so maybe that did the trick."*
9. *"They were not at all interested in seeing anything regarding COP."*
10. *"ERO has just been here… I doubt they even thought about H&S."*
11. *"ERO have been at the school but no extra safety review was undertaken."*

12-14. *"ERO but no COP" (x3)*

In January 2009, it was raised with ERO as an issue that in the ERO board guidelines for the Board Assurance Statement, the only comment about the COP was that *"Science teachers should become familiar with"* it. In response, the February 2009 revision of the board guidelines introduced for the first time a reference to the COP as one means of complying with the hazardous substances regulations applying to schools. The accompanying checklist, provided for completion before an ERO review asks, *"Since the last ERO review, has the board reviewed health and safety policies and/or procedures in the school linked to"* (Q13:) *"The Code of Practice for School Exempt Laboratories approved by the Environmental Risk Management Authority, about the use of hazardous substances for the teaching of science and technology?"*

In January 2009, as a response to effects of the Global Financial Crisis, State Services called for major cuts in government department budgets. ERO responded with staff cuts and a reduced school review frequency: the normal 3 year review cycle was extended to 5 years. (This was not a time that ERO could easily give more attention to chemical safety in reviews.) Despite this slashing of review activities (already devoid of chemical safety consideration) ERO's acting National Manager Reporting Services, Makere Smith, then declared:

> *"ERO is confident that the changes it has made to the Guidelines for Board Assurance Statement and Self-Audit Checklists (BAS) – Feb 2009 document, which includes references for accessing the Code of Practice, provides school boards with sufficient information to take all reasonable steps to ensure that chemical hazards in school laboratories do not harm anyone." In the July 2015 revision of the guidelines, the comment about the Hazardous Substances (Exempt Laboratories) Regulations 2001 remains unchanged:*
>
> *"One means of complying with these regulations is to conform to the Code of Practice for School Exempt Laboratories approved by the Environment Risk Management Authority."*

In a footnote are given (as Makere Smith noted in 2009) links to access the COP on both the ERMANZ website and the NZASE website. In July 2015 both of these links had ceased to work - ERO should have been aware that EPA took over the functions of ERMANZ in July 2011, and although there was a transitional link from the old ERMA website, in July 2015 that no longer functioned.

ERO should also have checked the COP link on the NZASE website. But the global financial crisis is over, and it is time for ERO to leave GFC thinking behind, embrace the school COP, and take its safety compliance-checking role more seriously. ERO needs to endorse the COP, and put a link to it on its own website, acknowledging that without reference to the COP:

> *"school personnel are unlikely to have the resources to independently comply with the provisions of the Act and Regulations".*

The ERO July 2015 checklist now asks, in relation to HSNO obligations, no longer whether they have been reviewed, but only if they exist:

"Does the board have health and safety policies, and procedures/guidelines/practices linked to:

....13 The Code of Practice for Exempt Laboratories approved by the Environment Risk Management Authority, about the use of hazardous substances for the teaching of science and technology?"

Schools will be able to tick this box without difficulty, however vague and inconsistent their hazard management practices, and however long since they were dusted off and considered. Recent ERO reviews of schools give no more evidence of commitment to ensuring chemical safety compliance than were reflected in the 2008 observations of science technicians.

Changing Health and Safety Regulations

In August 2015, the Health and Safety at Work Act was passed, and takes effect on 4 April 2016. The general purpose of this Act is that:

*"workers and other persons should be given the highest level of protection against harm… as is **reasonably practicable**."*

This replaces the Health and Safety in Employment Act 1992, which promoted the prevention of harm to all people at work, and others in, or in the vicinity of, places of work, through **taking all practicable steps**.

The Health and Safety at Work Act will also subsume requirements under other Acts if those requirements affect health and safety. A series of sets of regulations is also being prepared under the Act, including new **hazardous substances regulations**. The first "exposure" draft of the new hazardous substances regulations is expected to be released in November 2015. When these new regulations take effect, in place of the current ones under the Hazardous Substances and New Organisms Act 1996, there is a transitional arrangement for exemptions from regulations under the HSNO Act to be continued.

The current Schools COP operates under an exemption from the HSNO Act, so it can continue for a time to be accepted as meeting the regulatory requirements for hazardous substances in schools. Beyond that, it will be necessary to have a new schools COP which better reflects the purpose of the Health and Safety at Work Act, and a better-informed view of how schools can effectively manage chemical hazards to achieve the Act's purpose.

Moving Forward in Schools Chemical Hazard Management

The survey data in this report show that the current school chemical management COP has not been greatly successful, and largely for strategic reasons. To markedly improve school hazard management, that lack of success needs to be fully recognised and understood, together with the current and potential roles of all the stakeholders. Stakeholders to consider include the following:

COP writer (via NZASE?)

The COP itself could be improved. It is not a legal document, but is intended to guide and advise. For that it is poorly drafted; unnecessarily difficult to read and understand, and poorly set out for finding particular information. Any rewriting of the COP, to reflect changed requirements for school laboratories in the Health and Safety at Work Act era, should produce a softcopy version structured so that it can be searched readily and information easily accessed.

ERO

In writing the new COP, thought will need to be given to how schools' efforts at compliance may be regularly audited or reviewed. The assumptions made at the time of preparing the last COP, that when local councils ceased inspections, ERO would take up this role, has proved unjustified. If ERO are not to be funded for specialist staff to perform this function, it may be that schools need operational funding to regularly hire independent hazard management reviewers, and this requirement would then be a condition needing to be signed off before the new COP is authorised.

Board of Trustees

The method of appointment of a Laboratory Manager, and the terms, appropriate qualifications, availability of professional development, all need greater scrutiny, together with regular review of the role and achievements. In the current COP, the appointment model proposes appointment by the Board of Trustees, with an assumption that this best discharges governance responsibilities and establishes appropriate reporting relationships. Many Heads of Science have struggled to convince a sceptical BOT of the need for an appointment, and their need to then show interest in the work of the LM when appointed. The explicit removal of school board trustee personal liability under the Health and Safety at Work Act seems to further undermine the LM position. If a LM position is to be a BOT responsibility, then a better way will be needed to underline that, and to ensure a working relationship.

Ministry of Education

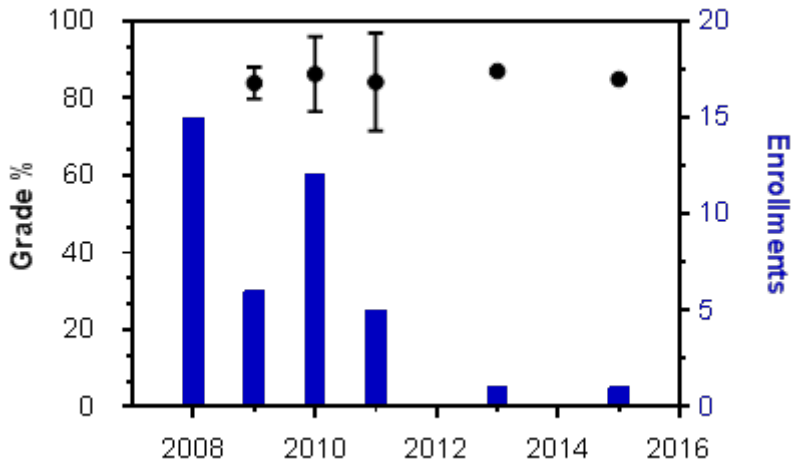
The Ministry of Education needs to contribute in a number of ways to facilitate and enable school LM appointments. The first and most significant is to remedy the serious shortfall in school operational funding which restricts school compliance actions. NZEI and PPTA have made submissions on the inadequacy of the operations grant since at least 2003. Reinforcing information has come from NZCER (2003, 2005), ERO (2006, 2007), Ministry of Education itself (2006, 2007), Waikato Institute of Technology (2007), University of Canterbury (2011). PPTA produced a further paper "A Level Playing Field?" in 2012. The conclusions of these studies are similar: school operations have become more complex with new demands (such as LM appointments), and schools have not been paid the real costs of the requirements.

Assuming an increase in funding that would enable all State and Integrated secondary schools to appoint a paid LM, the Ministry then has the important role of directing

that schools adopt the relevant hazard management COP – in line with earlier Ministry directives that they comply with other relevant COPs.

The University of Otago

Figure 1: HAXA401 School Technician enrolments



(Figure 1 provided by: Casey Davies, University of Otago)

From 2008 to 2015, as shown in the graph, a total of 40 school science technicians (although the current survey suggests one was actually a science teacher) enrolled and completed the Level 8 paper HAZA401 Managing Chemical Hazards, with an A average mark. The course is taught by distance learning in the first semester of each year, and is very relevant to dealing with a range of chemicals found in school laboratories. It concludes with a case study in which school-based participants prepare a chemical emergency plan for their school. However, since 2011 only 2 science technicians have taken the course. The drop-off is attributed to the general poverty of school operations, the refusal of the Ministry of Education and ERO to properly acknowledge school responsibilities for hazard management, and a resulting tokenistic approach to LM roles which makes it difficult for schools to justify the tuition fees.

The paper is not cheap, at more than $1700, and it would be helpful if University of Otago could more appropriately classify it as a Chemistry paper, rather than price it with their more expensive Health Science courses.

STANZ

STANZ has a gateway role to ensure appropriate science technician PD. It has successfully liaised with online providers to supplement the general skills of school science technicians, and if changes in hazard management requirements and school funding make it possible again, they should be working to see many more science technicians become competent (chemical hazard) Lab Managers.

In our technician survey we asked whether the school LM had completed this paper, and whether anyone else in their Science department had studied it. This located a number of science technicians who had used their study in the LM role, and some who had not. It also drew a protest from one science technician, answered as follows:

> *"I take note of your comment that there is other practical experience with hazardous chemicals (apart from the Otago paper in Managing Chemical Hazards) which may be relevant to the Lab Manager role. I agree. I worked in an R&D lab with chemicals and completed a NZ Certificate in Science, then went to uni and did a BSc in chemistry followed by several industrial chemistry jobs before my school role. However, in all this I recall nothing nearly as useful as the HAZX paper to focus on a theoretical framework for assessing, and practical steps for managing, chemical hazards. I took it in 2002, but in 2008 on request, Otago modified the paper to make it more applicable to a school context.*
>
> *From my experience, and from comments of other course graduates, I can say that even experienced industrial chemists find this a useful course of study if they are charged with managing chemical hazards in their school, because it takes a perspective not easily found elsewhere. (I don't have that formal responsibility here, but have done much of it anyway.)*
>
> *However, what the course particularly offers science technicians is the chance for those who have had less theoretical and practical experience of chemical hazards to also upskill so that there is no question they can do the job better than some random science teacher for whom Lab Manager is a third or fourth string responsibility. I believe that our Science Technician profession needs to value the course and push schools to allow their technicians to take it and allow more of them to get promoted as a consequence."*

NZSTA/PPTA/NZEI

The manner in which schools have in the past obliged Science staff (particularly Head of Science, and Head of Chemistry, but also other science teachers, chemistry teachers, and science technicians) to take on the chemical hazard management role without pay or any/adequate time to complete it, is disturbing. It can be understood in terms of very limited school strategic and financial options. However, it might be asked whether NZSTA has adequately pushed the case for better funding of school operations, and whether NZSTA could have worked in better with NZEI and PPTA in ensuring their members were not subjected to this iniquitous pressure to take unpaid responsibilities they could not discharge. Can we do this better?

While the PPTA teaching contract provides for teachers to be paid MMAs or a MU for the Lab Manager role at the principal's discretion, the NZEI support staff collective provides no basis for paying science technicians any extra. There is a need for the D grading criteria to include hazard management responsibilities alongside financial and staff administration as appropriate indicators for inclusion in this D grading.

No school staff or board member wants to see serious harm outcomes as a result of poor arrangements for ensuring safety, but we assume they are already happening, and there is potential for even more serious chemical hazard events. If there is a positive aspect to this situation of neglect, it is that legal action against unpaid pressed workers without a time allocation for a supposed responsibility must inevitably fail. School board members will also now not be liable for health and safety breaches because they are regarded as unpaid volunteers. So the responsibility falls on those paid to ensure safety. It would be really useful if NZSTA and PPTA and NZEI would ensure that such people can be found in a school, because there are clearly-defined terms of employment, there is funding to pay them, agreement on their recompense, and access to appropriate PD.

Worksafe/EPA

If a new schools chemical hazard management COP is to be prepared, then the negligent optimism which has prevailed with the application of the current schools COP will not suffice. The COP has been ineffective because schools were never resourced to implement it, ERO was never resourced to adequately review compliance, the Ministry of Education realized the school funding implications if they required schools to adopt it, so did not.

With this as history, clearly Worksafe/EPA will be worse than negligent if they again authorize a hazard management COP without ensuring that the school system in which it is expected to be implemented has assured resources to make it operate.

Acknowledgements

While the Science Technicians Association of New Zealand (through members of its executive) and many individual school science technicians, have generously helped us in enabling this survey and providing survey responses, the conclusions we have reached are our own, and do not reflect any institutional view.

We have been encouraged to carry out this survey by Ang Whitlam, Head of Science, and her deputy Ian Scoltock at Mt Albert Grammar School, as useful professional development. We appreciate that opportunity. Nevertheless, what we have written is in no respect a statement of the views of Mt Albert Grammar School or its Science Faculty, but we put this forward as reasoned conclusions from the survey data and other information available to us.

Michelle Kiernan and Ian de Stigter **11th October 2015**
Science Technicians
Mt Albert Grammar School