

BEGINNING TO JUST DO IT:
CURRENT WORKPLACE AND ENVIRONMENTAL CONDITIONS
AT THE TAE KWANG VINA NIKE SHOE FACTORY IN VIETNAM

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Executive Summary

The Tae Kwang Vina (VT) factory, which produces shoes exclusively for Nike Inc. in Vietnam, has implemented important changes over the past 18 months which appear to have significantly reduced worker exposures to toxic solvents, adhesives, and other chemicals. The factory has substituted less harmful chemicals in its production, installed local exhaust ventilation systems, and trained key personnel on occupational health and safety issues.

However, while important improvements have been made at VT, significant health and safety issues still remain. Workers in some sections of the plant still face overexposures to hazardous chemicals, and to heat and noise levels in violation of Vietnamese and comparable US laws. There is thus a need to fully evaluate and control exposures to chemicals, noise, and heat, and to establish an effective on-going health and safety management program. Respiratory illness rates also remain a concern. Further steps are needed to bring this factory into compliance with US Occupational Health and Safety Administration (OSHA) standards, as pledged by Nike.

These conclusions are based on a six month process involving Nike, VT factory managers, and two independent analysts – Dara O'Rourke and Garrett Brown – to identify and evaluate workplace health and safety problems inside this factory. The process involved independent research and interviews in Vietnam by Mr. O'Rourke in July and August of 1998, an exchange of information and several face-to-face meetings between Nike managers, Mr. O'Rourke, and Mr. Brown from September to November 1998, and a one-day re-audit of the factory by Mr. O'Rourke on December 21st, 1998.

This evaluation process has been narrowly focused on environmental and occupational health issues in one Nike factory in Vietnam. Due to time and data limitations it was not possible to analyze other issues of concern to workers, human rights and labor groups, such as wages, freedom of association, and independent monitoring. These issues would benefit in the future from similar collaboration and open dialogue.

Background on the Process

The Tae Kwang Vina factory (referred to as "VT" by Nike) has been the focus of international attention since November 1997, when a story appeared on the front page of the New York Times describing poor working conditions and dangerous levels of chemical exposures inside the factory. The New York Times report was based on research conducted by Mr. O'Rourke between April and October 1997, and on information contained in a leaked Ernst & Young audit of the factory.

This report is a follow-up to the Ernst & Young audit and Mr. O'Rourke's analysis from 1997. The information for this report was obtained by Mr. O'Rourke during a research trip to Vietnam under the auspices of the United Nations Industrial Development Organization during July and

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August 1998, and a follow-up audit of the factory in December 1998. Mr. O'Rourke, who speaks Vietnamese, interviewed workers and government officials during these trips, and was given six government reports that had not been previously made public, which document working and environmental conditions inside the Tae Kwang Vina factory.

In late August, Mr. O'Rourke contacted Nike to discuss the problems identified by workers and government officials, and to discuss Nike's plans for abating these problems. Nike agreed to meet with Mr. O'Rourke and Mr. Brown, who is a technical expert on occupational health and safety issues, to evaluate the information collected by Mr. O'Rourke. Nike then agreed to research the problems and report on the status of abatement. Nike provided air sampling data for the factory conducted by Reliance Insurance, and Material Safety Data Sheets (MSDS) for most of the new chemicals used in the plant. In December, Nike agreed to allow Mr. O'Rourke to return to VT for one day to independently evaluate conditions in the plant.

Improvements at VT Since October 1997

The Tae Kwang Vina (VT) factory, which produces shoes exclusively for Nike, has implemented important changes over the past 18 months which appear to have significantly reduced worker exposures to toxic solvents, adhesives, and other chemicals. The factory management seems to have a much better awareness of workplace health and safety issues, is now more committed to providing a safe and healthy working environment, and has assigned responsibility for these issues to a top manager.

Significant investments have been made in the transition to primers, adhesives, and cleaning agents with reduced volatile organic compound (VOC) content. These changes have resulted in: near complete elimination of toluene (although it is still remaining in adhesives used in the cup-insole section and air bag spraying); near complete elimination of acetone; significant reduction of Methyl Ethyl Ketone (MEK) (although it is still being used in several sections); and complete elimination of methylene chloride. A range of new compounds with reduced organic solvent or natural solvent content are now being used in the plant.

VT has focused most of its efforts in the past year on the reduction or elimination of worker exposures to airborne chemicals in the workplace. This was appropriate and important. Substitution is clearly a much better strategy than ventilation control or worker personal protection. Other improvements have also been made, including:

- Ventilation systems have been installed in: cup-insole (hoods), cement mix rooms (fans), TPR (hoods and vacuum system), injection (hoods), lamination (fan and hood), PU3 (hoods), and the chemical warehouse (separated room with hood).
- Important changes in personnel have also been made at VT. Both the Korean and Vietnamese staff responsible for health and safety issues are much stronger than in the past. VT has carried out training of Korean and Vietnamese managers and some workers, which is beginning to show results. Vietnamese supervisors are being trained on MSDS's and personal protective equipment (PPE) issues.
- VT recently purchased direct reading screening equipment to monitor air quality and noise inside the factory. Screening for airborne contaminants is conducted once per week to evaluate total exposure levels. VT also purchased air current smoke tubes to evaluate the effectiveness of fans and ventilation systems.

- VT has partially implemented a PPE program, but, as discussed below, it needs to be improved.
- VT has improved its hazard communication. Summary information on chemicals was posted at each section, which was based on a template that included warnings on impacts on eyes, skin, inhalation, ingestion, and chronic and acute signs and symptoms.
- VT is renovating bathrooms. Two have been completed, one is under construction, and eight more need to be renovated. The renovated bathrooms have much to recommend them over the old ones. Bathroom renovation is scheduled to be completed by April 1999.
- VT has installed 48 drinking fountains throughout the plant which provide both cold and hot water. Drinking water had been a major concern of workers in the past.
- VT has installed a new incinerator which is said to be more efficient and less polluting.
- VT has expanded their materials recycling program, which consists of sales of scrap to off-site companies that either re-use, repackage, or recycle the materials. VT is now selling: polybag, EVA scrap, PU foam, cans, drums, cartons, and waste oils. VT also purchased a rubber re-grind machine.
- VT has improved chemical delivery and handling. The company has made major changes in the chemical mixing area – constructing rooms with hoods to do mixing, and providing workers with respirators and lab coats. This section previously had workers with no protection and poor ventilation. MEK is also delivered more effectively through three procedures: a pressurized canister system; a spring loaded dispenser (workers push down and a teaspoon sized cup fills with the chemical); and a small dish with a partial cover over it.
- VT is beginning to implement the MESH system (Management of Environment, Safety and Health), which is Nike's customized environmental and occupational health management system. VT has completed 3 of 9 workshops on MESH implementation.
- VT had useful documentation of management programs regarding environment, health, and safety. The SHAPE inspection reports appear comprehensive. VT now has a newsletter that is published every two months which contains information on health and safety issues.

Outstanding Issues as of December 1998

VT clearly has made important progress on several fronts. However, a number of issues of concern remain.

Illness Rates

Reported illness rates appear to have improved at VT. However, inconsistencies in data and poor tracking of causes of illnesses make drawing any concrete conclusions difficult. The Dong Nai Health Department reports that nose and throat diseases, a measure they have used in the past as a proxy for respiratory ailments, have decreased in the last year. Government data show that in 1996, approximately 77 percent of workers experienced nose and throat illnesses. In 1997, this rate increased to 86 percent of workers tested. However, in 1998, only 18 percent of workers tested suffered from nose and throat illnesses.

VT's 1998 internal clinic data show that 35 percent of clinic visits were for treatment of upper respiratory tract illnesses. This is a slight reduction from 1997, when 38 percent of visits were for respiratory illnesses.

However, VT's yearly clinic data report shows that clinic visits increased in 1998 by approximately seven percent. Unfortunately this data only correlates visits with symptoms, and does not allow evaluation of which workers visited the clinic for which ailments. Upper respiratory tract ailments remain the leading cause of illness, according to VT clinic reports.

In general, VT does not have a good system for tracking worker illnesses or accidents. For instance, it is not possible to track which sections have which illness rates. The doctor at VT was not able to provide us with information on trends in illness rates. The factory just began tracking illnesses in November 1998, so they have no data on the health impacts of the transition to reduced organic solvent compounds. VT also lacks data on background illness rates of the general population in the province.

There is clearly a need for a systematic evaluation of illness rates in the factory, particularly focusing on respiratory tract and contact dermatitis symptoms. It would also be useful to evaluate whether illness rates have decreased since the switch to reduced organic solvent compounds in specific sections of the plant.

Chemical Exposures

Nike's approach to chemical exposures – substitution with reduced solvent compounds – while very important, does not eliminate this issue entirely. Some of the new adhesives, primers, and cleaning agents still contain organic solvents, albeit at reduced levels, may have unknown new hazards, and may have the potential for synergistic effects with the old materials. At the same time, in several sections of the plant workers are still using the "old" higher VOC-content solvents.

There is thus a need for a systematic evaluation of the hazards posed by these new and old compounds. Exposures to "old" materials such as MEK need to be evaluated and controlled. New materials need to be fully evaluated for any potential adverse health impacts. This might be performed within Nike's program to sponsor academic research on health and safety issues (announced in May 1998). The MSDSs Nike has provided offer very little information on health effects. Full-shift air monitoring, epidemiological studies of illnesses, and toxicological evaluations of materials are all needed to ensure the new chemicals do not pose their own adverse health effects.

Air sampling conducted by Reliance Insurance on November 11, 1998, showed over-exposures (above Vietnamese permissible exposure levels) in several areas of VT. "Total Other Hydrocarbons" were measured at 750 ppm in the cup insole section. Adhesives used in cup insole still contain toluene, a reproductive health hazard which has a PEL of 200 ppm. Solvent exposures need to be re-evaluated in this section, and specific chemicals need to be identified.

Cyclohexanone was measured above the PEL in two sections of the factory. Cyclohexanone, which is a component of Bond Ace 232H, causes eye, skin, and throat irritation above 50 ppm, and can cause liver and kidney damage at higher exposure levels. These exposures should be reduced and then re-evaluated. Bond Ace 232H also contains 3-5 percent Dimethylformamide (DMF). DMF is toxic to the liver, causes nausea and anorexia, and is readily absorbed through the skin as well as the lungs. Future air sampling should evaluate DMF exposures in all sections using Bond Ace 232H until this chemical is eliminated from use. (Nike asserts that the MSDS for Bond Ace 232H may incorrectly report DMF content. If the MSDS is flawed, this would raise questions about the hazard information being provided to workers.)

With regard to the walk-through tour of the plant, we encountered a strong, sweet solvent smell (similar to MEK or acetone) in the “blow-by” hand cleaning operation next to PU rotary pouring machine (PU mold release). Workers were using D-PLY 233 BFU, which is a mix of MEK (~50%), solvent refined heavy naphtha, ethyl acetate, isopropyl alcohol, and butyl acetate. The Dong Nai Health Department found high levels of acetone in this section, where workers were not wearing respirators or gloves. Some cleaning is also done with MEK after the PU mold.

VT managers said workers using MEK were provided 3M model 9913 respirators. However, the workers we observed were either wearing cotton masks or were wearing the 9913 respirators incorrectly. Cotton gloves were being used by some workers in this section, while others used light plastic gloves. Cotton gloves and dust masks obviously are not effective in protecting workers from MEK exposures. It does not appear that Reliance sampled for MEK in this area. MEK and acetone exposures need to be re-evaluated, and then reduced or eliminated in this area.

Other chemical exposure issues include:

- It seemed possible that workers may be exposed to isocyanates during opening of chemical containers and transfer to the PU mold machine. There is a need to evaluate this process and measure isocyanate exposures during opening and transfer of isocyanates into the PU pouring machine. We did not observe this process, but were told that workers use the 9913 respirators when they transfer the isocyanates which are potent respiratory system irritants and sensitizers.
- Workers were exposed to Phylon dusts in the “pre-form grinding” section. Some workers wore dust masks, others wore carbon filter respirators. Some workers wore the carbon respirators over cotton masks, thus significantly reducing the effectiveness of the PPE.
- The air bag spraying section is still using two compounds – AB333 and Bond Ace 238 – which contain toluene, acetone, MEK, cyclohexanone, and DMF according to their MSDSs. Evaluation and control of these hazardous exposures, as noted above, should be conducted in this section. Worker exposures to paints in the air bag spraying section also needs to be regularly evaluated. It is not clear whether Reliance sampled for this range of chemicals in the air bag spraying section.
- The assembly section is still using MEK for cleaning uppers. There is a downdraft local exhaust ventilation (LEV) system in place, which is a significant improvement, but we observed workers using inappropriate amounts of MEK.
- The effectiveness of ventilation systems throughout the plant depend on preventative maintenance and periodic testing. On-going ventilation maintenance programs are essential for controlling employee exposures.

Noise

The generator room had very high noise levels. We measured noise at approximately 100 decibels (dBA) in the generator room. VT staff measured noise levels at 104 dBA in this section on November 28, 1998. When we were in the section, there was one Korean manager and one Vietnamese worker in the room. The Korean manager had ear plugs while the Vietnamese worker wore no hearing protection.

VT staff measured noise levels in the Press room and EVA roller mill section at 104.5 dBA on November 28, 1998. We observed a number of workers in the Press room without any hearing protection. Throughout the plant we observed workers not wearing hearing protection in sections where it was required and signs were posted.

Screening results indicate that virtually all work areas have noise levels above 85 dBA. In the U.S. employee exposures above 85 dBA require: (1) annual worker audiograms; (2) employee training on adverse health effects and the importance of PPE; and (3) provision and training on use of PPE. Exposures above the PEL of 90 dBA require the employer to install feasible engineering controls to reduce levels to below 90 dBA, and to require the use of PPE.

Heat

Working temperatures are still exceeding Vietnamese regulations (32°C). Ceiling fans haven't done much to reduce temperatures.

Press room workers had vents at their feet blowing cool air up at them, but the temperature in the room was still approximately 37°C according to a thermometer on a wall. VT staff monitored temperatures on November 28, 1998 (a cool time of the year) and found that the Press section reached 37.5°C, the mixing/rolling section reached 37°C, and the Phylon Press section reached 36°C. During the hot months, these temperatures could easily exceed 40°C.

Use of fans to move air at temperatures above 35°C (approximately 95°F) actually increases the impact of the heat on the body. Ventilation systems, to be effective in reducing body burden, must circulate air below 35°C. VT managers have not dealt with the heat issue effectively.

Personal Protective Equipment (PPE) Program

The PPE program at VT is not functioning effectively. PPE is used sporadically and often inappropriately throughout the factory. When not used properly, PPE can do more harm than good.

PPE programs are admittedly complicated to run effectively. For example, respiratory PPE programs must be based on known exposure levels, use respirators and cartridges appropriate to the chemicals, change cartridges regularly to prevent overloading, train workers in use, and be properly enforced. In the US, employers supplying respirators are required to have a written respiratory protection program, have medical evaluations of users, conduct individual fit testing, training, and equipment replacement schedules. VT does not conduct medical evaluations or individual fit-testing for workers using respiratory PPE. Similarly, gloves must be selected based on known exposure levels and specific chemicals encountered, and must be changed before penetration occurs.

We observed dust masks worn below the nose (in PU pouring and assembly), cotton masks worn underneath 3M respirators (in Phylon pre-form grinding), cotton gloves used in numerous sections with skin exposure to solvents, and the absence of PPE (in assembly, hand-cleaning, press, and other sections). In the Screening section, VT was requiring the use of negative pressure half-face respirators, however, several workers were not wearing them, and others were wearing them incorrectly.

Overall, people are not being trained properly in the use and storage of PPE. PPE was stored in glass cabinets with air vents that allowed masks to be contaminated. PPE training for shop supervisors does not appear to be effective as supervisors permit workers to wear PPE improperly.

The use of cotton gloves and cotton dust masks throughout factory raises an important issue. Workers obviously feel the need for some protection, but these masks and gloves may be doing more harm than good by generating a false sense of security. Until a systematic health study is performed that shows workers what the actual exposure levels are in their workplaces, and how

they can effectively protect themselves from these hazards, workers are likely to continue to request and use cotton masks and gloves in inappropriate ways.

Ergonomics

There are poor ergonomic conditions throughout the factory. For example, in the phylon pre-form grinding section, women were hunched over on small wooden boxes doing the grinding operation. There is a need to conduct a study on ergonomics in the factory, including the assembly line, press shop, and stitching sections.

Worker Training

Safety training did not appear to be consistently effective throughout the factory. For instance, we observed two women working together to run a cutting machine which had a two-hand operation safety system. Each one would push a button with one hand, and use their other hand to insert the material into the dies, thereby defeating the purpose of the two-hand control safety system.

When watching one woman apply MEK, using the canister system, a VT staff member reached over and closed the nozzle considerably. Apparently some workers don't know how much to apply or how to control the delivery of MEK through the canister system.

Safety Program

A small group of managers alone cannot implement an effective safety program for a factory with 8,500 workers. There is a need to develop a systematic safety management program at VT which would include a committee of supervisors and employee representatives which meets regularly, and implementation of written programs for respiratory protection, hearing protection, regular inspections, and on-going evaluations of employee exposures.

Incinerator Emissions

VT's old boiler (or manual incinerating machine) is still being used to burn scrap to generate steam. The new incinerator appears much better, but does not produce enough steam to eliminate the need for the old boiler.

Air pollution from the old boiler does not meet Vietnamese environmental standards. The Dong Nai Department of Science, Technology, and Environment (DOSTE) has measured air emissions from the boiler – which exceed Vietnamese standards for at least carbon monoxide (CO) and nitrogen oxides (NOX) – and has asked VT to develop a compliance schedule. The DOSTE measured NOX to be 1505 mg/m³ on October 12 and 13, 1998. These emissions need to be brought under control and then measured again. VT does not have a compliance schedule in place.

It is also unclear where ash from incinerator is disposed. This ash is potentially hazardous and should be handled extremely carefully.

Recommendations for Tae Kwang Vina

- Nike should conduct a systematic evaluation of illness and accident rates in the factory, and assess whether illness rates have decreased since the switch to reduced organic solvent compounds. A system should be established to track and evaluate the illnesses reported by workers in each section of the plant.
- Nike should conduct a comprehensive evaluation of the hazards posed by the new compounds. This might be conducted in collaboration with university researchers, as was proposed in the May 1998 initiatives.
- VT needs to implement a comprehensive hearing protection program including engineering controls to reduce noise, annual audiograms of exposed workers, training on adverse health effects and the importance of PPE; and provision and training on use of PPE.

- VT needs to effectively deal with the heat issue in the press room, mixing/rolling section, and Phylon press section.
- VT needs to significantly improve its PPE program, and to improve worker safety training.
- Nike should conduct a study on ergonomics in VT.
- VT should develop a systematic safety management program which includes a safety committee with supervisors and employee representatives, and implementation of various written programs described above.
- VT needs to develop a better system for worker complaints, responses, and general representation.
- VT should install pollution control technology for the old boiler or phase it out completely.

Conclusions and Next Steps

Important improvements have been made in the Tae Kwang Vina (VT) factory over the last 18 months. However, more work needs to be done to meet Nike's pledge to comply with US OSHA standards in this factory, both on airborne contaminants and other health and safety issues. VT has made a positive start, but now must take further steps (including those outlined above) to guarantee a safe and healthy working environment for all its workers.

This process regarding VT provides evidence that NGO participation in factory monitoring can be constructive and beneficial to companies such as Nike. Independent NGOs can help gather information on factory conditions and treatment of workers, and can serve to make the monitoring process publicly accountable. An open process of this sort can facilitate the verification and resolution of workplace health and safety problems inside subcontractor factories, help build trust between companies and the NGO community, and help set priorities for future action.

A similar process should be expanded and then evaluated in other factories and countries around the world. NGO participation in monitoring should also be considered by other companies in the industry, such as Reebok and Adidas, who have similar codes of conduct, but have yet to establish a credible system of independent monitoring of their factories.

We agree with Nike that in areas as challenging as workplace health and environmental concerns, "There Is No Finish Line." However, recent cooperation with independent analysts has been an important step down the road to improved factory conditions.

Appendix - Sources of Information

- Report by the Ministry of Labor, Invalids, and Social Affairs, dated June 5, 1998, 5 pages.
- Report by the Ministry of Labor, Invalids, and Social Affairs, dated April 24, 1998, 6 pages.
- Air quality analysis by the Industrial Health Center of the Department of Health, dated April 20, 1998, 1 page.
- Report by the Ministry of Health, dated December 23, 1997, 6 pages.
- Air quality analysis by the Industrial Health Center of the Department of Health, dated December 19, 1997, 1 page.
- Interviews with workers in August 1998 conducted by Mr. O'Rourke.
- Interviews with Vietnamese government officials in August 1998 conducted by Mr. O'Rourke.
- Interviews with workers in December 1998 conducted by Mr. O'Rourke.
- Reliance Insurance air sampling report summaries dated November 11th and September 11th 1998.

- Material Safety Data Sheets for Aquace W-102, Bond Ace W-01, Bond Ace W-101, Bond Ace 232H, Bond Ace 238, D-PLY 233 BFU, D-PLY P-8D, AB-333G, Biogenic 110, Biogenic 175, Biogenic 175-3, Biogenic 180, and Biogenic 190.
- VT clinic reports dated December 24, 1998.
- VT report on Environmental Improvement Actions dated August 12, 1998.
- VT noise and temperature measuring reports dated November 28, 1998.

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