# THE HAZARD CLASS SYSTEM A TREND TOWARDS INTERNATIONAL UNIFICATION OF WOOD PRESERVATION STANDARDS

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## Introduction

In recent years there has been a growing interest in wood preservation circles concerning the use of a Hazard Class system to define wood preservation standards. A prototype system was developed jointly in New Zealand and Australia in the mid 1980's in response to a growing awareness that the existing standards were becoming unworkable because of their complexity. The new system was quickly adopted, both by industry and the general public and it remains in use today largely unchanged from its initial inception.

Based on this success several countries have been exploring the possibility of adapting similar systems to their own wood preservation standards. Over the last two to three years the concept has moved forward strongly within the American Wood Preservers' Association (AWPA). This paper reports on progress within the AWPA to develop a Hazard Class system and summarises recent developments in other parts of the world.

## The Hazard Class System

Hedley (1990) observed that existing wood preservation standards were derived from one or more of three categories. These were identified as :

1) Average retention specifications in which treatment charge retentions that need to be achieved are expressed as weight of preservative per unit volume of wood.

2) Results type specifications which stipulate minimum retentions by analysis in specified retention zones.

3) Process specifications which prescribe treating schedules to be used with specified processes.

A Hazard Class system is fundamentally more simple and can be described as a way of defining wood product usage in terms of biodeterioration exposure and economic value (Preston et al. 1992). Using such a system most treated wood commodities can be placed

into different Hazard Classes to determine the retentions and penetration of preservative components necessary to provide adequate service life for that commodity. Logically, as the biodeterioration hazard increases, so does the Hazard Class number and with it the requirement for higher preservative retentions and penetration. Limitations are also placed on the types of approved preservatives and species that can be treated with increasing Hazard Class number.

The desire to change from existing wood preservative standard systems implies that problems exist with those standards.
Perhaps the most readily identified problem is that of complexity. Much of this complexity can be explained by the fact that current standards have "evolved" from simple beginnings to their current format. Standards develop down a given pathway for several reasons. Those reasons reflect the purpose of the standards, the users of the standards and how the standards will be policed. The number of uses for treated wood has escalated in recent years and this has added to the complexity. Standards are now being used and consulted by groups that are more diverse than those that were anticipated when the standards were originally defined. In addition, environmental pressures are forcing us to re-evaluate where we are putting preservative treated timber and how much toxic chemical load is being put into the environment. These were not issues when most existing standards were developed. The process of "evolution" has contributed to a multitude of anomalies in our existing standards. For example with the AWPA standards several anomalous penetration standards can be found. Export opportunities for value added treated wood products are being lost because wood preservative standards of a supplying country do not correspond to those of the buyer.

*Australia and New Zealand*

New Zealand and Australia share close economic relations and the existence of a common hazard class system has been useful in the bilateral trade of treated timber commodities. Both countries recognise six Hazard Classes. Of these six classes two describe ground contact hazards (H4 and H5) which can be distinguished based on the value and replacement costs of the commodities that they contain. Low value commodities, for example fence posts, are allocated to Class H4. Class H5 is intended for high replacement cost items which need higher retentions eg. transmission line poles and foundation timbers. Tied in with the hazard class system is an informal protocol for the approval of new preservatives and commodities based on a combination of laboratory tests and field tests.

*Europe*

A single European market is scheduled to come into effect by December 1992. In conjunction with this landmark occasion it is intended that all European wood preservation standards be harmonised under one umbrella. However, despite the diligent efforts of the CEN Technical Committee TC 38 it is apparent that all these standards will

not be in place by December 1992. Progress has been made with the development of EN 460, EN 335 and EN 599 standards. These are important milestones in the move towards a unified Hazard Class sytem for Europe but much work remains to be done. Interestingly, the proposed European system appears to advocate five Hazard Classes instead of the six used in Australia and New Zealand. Three of the proposed classes relate to above ground use of timber, one ground contact hazard is recognised and one salt water exposure (Bravery, 1992).

*Canada*

The situation in Canada seems confused. A new draft wood preservation standard CSA 080 was completed in 1990 but now seems to be on hold. The document is very comprehensive but has been criticised for its complexity. Elements of CSA 080 could quite readily be adapted to a hazard class system but it is likely that progress in this direction will not occur until the AWPA standards are revised.

*USA*

A joint Preservatives and Treatments Committee task force was set up in 1989 by the AWPA Executive to establish the feasibility of converting the existing AWPA standards into the Hazard Class format.

Early during the discussions a minor but contentious issue relating to the use of the word "Hazard" surfaced. In New Zealand, Europe and Australia the term "Hazard Class" has found acceptance. But the term was less agreeable to AWPA members and it was decided that the system should be referred to as a "Use category" system. To conform with existing and proposed international Hazard Class systems the 'H' designation eg. H1 was retained.

The current AWPA standards are primarily based on results type specifications which stipulate minimum loadings in specified retention zones. Attempting to fit the existing standards into the Hazard Class framework has been a major task because of the the multitude of species and penetration requirements which currently exist. Several of the specifications are anomalous, apparently unsupported by thorough scientific reasoning. While this should mean that they should be resolved quite simply, political and commercial interests are complicating the situation.

Six major Use Categories are proposed in the new AWPA system but within categories H5 and H6 further subdivisions are envisaged. A description of the service conditions for which products in each category are intended is as follows:

**Use Category H1**

Commodities are used out of ground contact and protected from the effects of weather and interior sources of moisture.

**Use Category H2**

Coated, exterior construction materials that are not in contact with the ground or foundations but are exposed to the full effects of weathering.

**Use Category H3**

These commodities include wood and wood based products used out of ground contact but exposed to the full effects of the weather.

**Use Category H4**

Wood and wood based products used in contact with the ground and fresh water or other conditions favourable to decay.

**Use Category H5**

Wood and wood based products in ground contact either in higher decay hazard conditions than H4 (eg. horticultural sites) or when the treated material is a critical component of a structure such as foundation piling or building poles.

Three subcategories are distinguished:

H5A critically important components such as permanent wood foundations in regions of moderate potential for wood decay.

H5B Utility poles used in environments with severe potential for decay, building poles with critcal design and use requirements and posts use in horticultural sites.

H5C Foundation Piling

**Use Category H6**

Wood products in marine exposure or brackish water

H6A Material exposed to shipworms (*Teredo*)and *Limnoria* other than *Limnoria tripunctata*

H6B Material exposed to *Teredo* and *Pholads*

H6C Material exposed to *Teredo, Sphaeroma terebrans* or to both *Limnoria tripunctata* and *Pholads.*

Within each use category it is intended that all commodities have a common retention for each preservative that is recommended for that Use Category. The number of subdivisions is somewhat more complex than that for existing or proposed Hazard Class systems.

From the beginning it was accepted that a complete overhaul of the existing AWPA standards was an ambitious task. Much of the
basic framework required has been completed but considerable challenges remain. Quality assurance issues and branding requirements have yet to be addressed. Since the existing standards will have to be rewritten to conform to the new format it was decided that it would be an appropriate time to convert data to their metric equivalents.

A protocol for the adoption of new preservatives has also been developed recently. The structure of this new protocol is intimately centered around the proposed Use Category system format.

A flexible timetable for these changes has been suggested. A submission to the Executive Committee will be made in the fall of 1993 for information only. The following year a proposal to the AWPA Committees will be made. It is hoped that by July 1995 all editorial changes to the new Use Category system will be complete and the new Standards will be fully ratified by written ballot.

## Bibliography

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