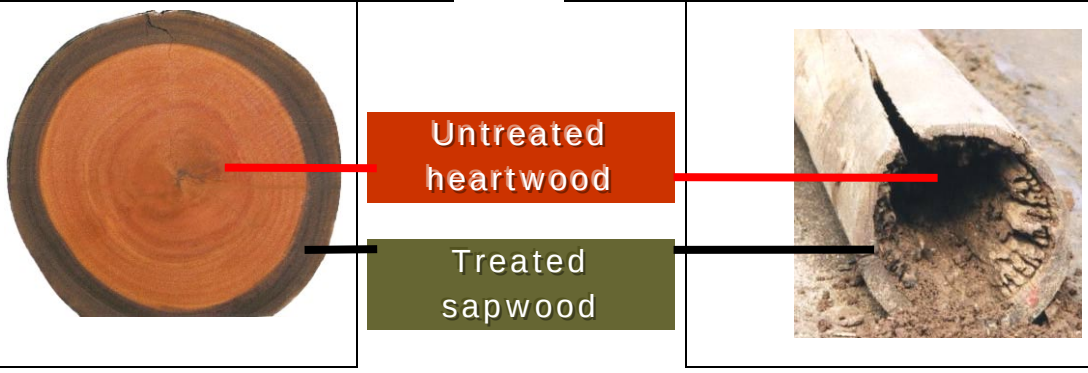
RETREATMENT FOR UTILITY POLES IN SERVICE

1. THE PROBLEMATIC OF REMEDIAL TREATMENT OF UTILITY POLES .

The processes used for the impregnation of round wood reach only the sapwood, and let the heartwood untreated.

Insofar as the untreated heartwood is surrounded by the treated sapwood, one could consider that it is protected against biodegradation.

However, micro and macroscopic cracks that are inevitable on wood poles in service let rot fungi reach and destroy the internal untreated heartwood, especially at the groundline area.



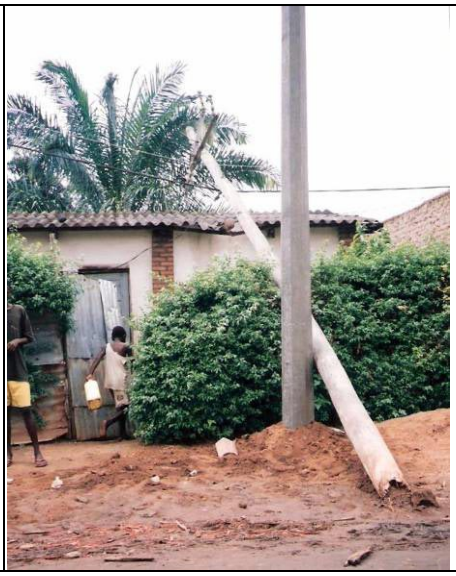
2. CONSEQUENCES OF INSUFFICIENT TREATMENT OF THE HEARTWOOD .

The untreated heartwood at the ground level is quickly attacked by rot fungi and termites.
Without retreatment, rot decay at the groundline is the cause of more than 90% of the mechanical failures, **<u>while the rest of the pole is still safe</u>**.

http://www.cbs.cbt.com/

Other illustrations of failure at the groundline, **while the rest of pole is quite safe**

http://www.preschem.com



3. USUAL SOLUTIONS TO ROT DECAY AT THE GROUNDLINE .

To face this situation, various solutions have been finalized: metallic or reinforced concrete foundations and mainly, **additional treatments localized at the groundline** of the poles.

3.1 Special foundations of the poles

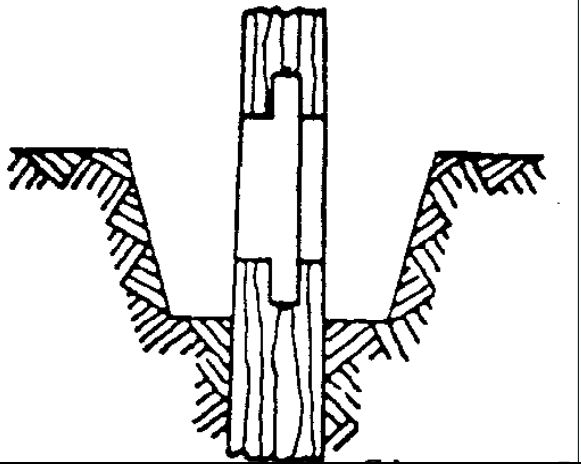
Metallic and concrete foundations

3.2 Additional treatments

3.2.1 Mechanical injection (Cobra process) – preventive

3.2.2 Mechanical injection (Cobra process) – curative

3.2.3 Antiseptic bandages

	
http://www.preschem.com	

3.2.4 Antiseptic Rods

		
www.publish.csiro.au		http://www.preschem.com

3.2.5 Incising

	Incising improves penetration of chemical in the groundline area and results in a higher retention of preservative.
www.bois-ril.ch/body/	

3.2.6 Deep heart incising

Standard, Groundline (cedar) or Full-length (D.fir) Incising - mechanical perforation process used to aid in achieving consistent penetration in the incised area. Approximately 3/4" deep.

Deep Heart Incising - mechanical process that performs a 2.5" radial perforation in a 3" by 6" diamond pattern, used to further protect the tubular strength at the groundline of Douglas fir poles, or full-length of Douglas fir marine piling.

Radial Drilling - manual process similar in function to Deep Heart Incising except it can be up to 6.5" deep.

Through Boring (Drilling) - A process that attempts to achieve 100% penetration of the groundline area (and of some tops) of poles with preservative. This manual process consists of drilling many specified diameter holes completely through the pole at the groundline area and top.

http://www.jhbaxter.com/FAQ.html

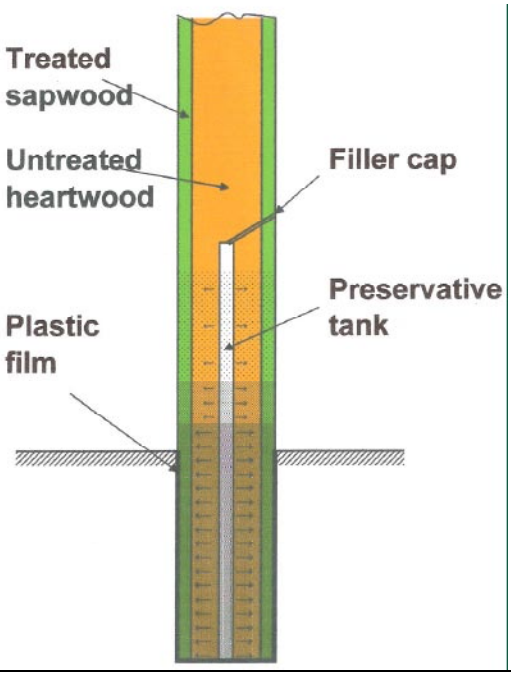
3.2.7 Internal voids treatments

"Poles that contain large voids caused by insects or fungal attack are often treated with internal void chemicals. These treatments are injected under low pressure into a hole drilled directly into the void, and are presumed to coat the surface of the void to prevent further expansion."

http://fcg.cof.orst.edu/rc/RC15.pdf

4. SPECIAL PROTECTION OF THE GROUNDLINE BY INTERNAL DIFFUSION PROCESS.

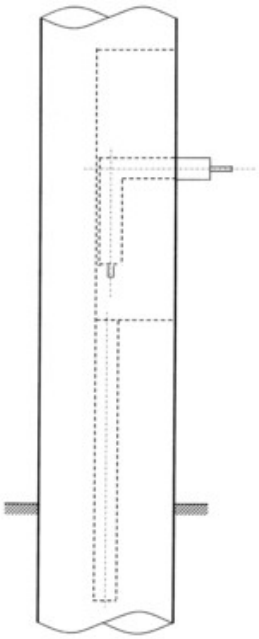
4.1 Method



A longitudinal hollow of 3.2 - 5 cm diameter, is drilled from the butt end to 1 m above the groundline, in order to constitute an internal tank for the antiseptic.

This chemical will impregnate the wood by osmosis, not from exterior towards interior as usually, but from interior towards exterior.

On poles in service, the tank is drilled from a working space realized above the groundline.



4.2 The chemical used

The retreatment techniques are resorting to osmosis in order to achieve impregnation of wood.

The internal diffusion process is using the same existing chemicals.

4.3 Impact on the mechanical resistance of the pole

For an internal tank of 3.2 cm of diameter, the drop of mechanical resistance of the pole doesn’t exceed 5%.

4.3 Advantages of the technique

1° the quantity of chemical introduced is 2 - 4 times more than with the actual methods

2° there is no migration of chemical into the surrounding soil: the preservation of the environment is therefore maximal

3° renewal is very easy to realize

4° universally indicated: all sorts of wood, all diameters and all degrees of drying

In conclusion

It is well known that without retreatment, rot decay at the groundline of utility poles causes more than 90% of poles failures!

The special protection of utility poles at the groundline is then a major concern for electricity distribution authorities.

However, and that's a pity, in most developing countries, no maintenance of utility poles is realized.
Maintenance of utility poles is a way for considerable savings as well in continuity of service as well as money for replacement

Among many techniques for retreatment of utility poles in use, internal diffusion process has many advantages in points of view of environment protection, reliability, cost and technical effectiveness, etc.

AWARDS

GOLD MEDAL HAS BEEN AWARDED TO THIS TECHNIQUE AT THE 34TH EXHIBITION OF INVENTIONS OF GENEVA

PATENTS

Search for patentability of this technique has been done by the European Patent Office on the request of the World Intellectual Property Organization – WIPO.

Patents granted

Burundi

Switzerland

Organisation Africaine de la Propriété Intellectuelle - OAPI:

Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Senegal, Togo.

Patents pending

African Regional Intellectual Property Organization - ARIPO:

Botswana, Gambia, Ghana, Kenya, Lesotho, Liberia, Malawi, Mozambique, Namibia, Sierra Leone, Sudan, Swaziland, Tanzania, Uganda, Zambia, Zimbabwe.

European Patent Office:

European Union