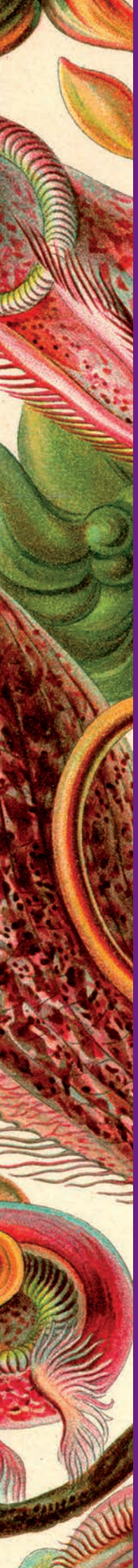

CAPACITY DEVELOPMENT

Food and Agriculture Organization of the United Nations

International Plant Protection Convention

APR 2023

ENG

Guide to the regulation of wood packaging material

Understanding the phytosanitary requirements for the movement of wood packaging material in international trade

With the technical support of

Canadian Food Inspection Agency

Agence canadienne d'inspection des aliments

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Abstract

This guide provides comprehensive, yet easy to understand, information to improve the understanding of International Standard for Phytosanitary Measures (ISPM) No. 15 (*Regulation of wood packaging material in international trade*). It provides practical guidance to help national plant protection organizations apply the phytosanitary measures that are currently approved in ISPM 15 and describes the procedures required to produce compliant wood packaging material. The guide is also expected to be relevant to ISPM 15 treatment providers, wood packaging material manufacturers, repairers and remanufacturers, and other stakeholders, to help them to improve compliance with ISPM 15 and reduce the incidence of quarantine pests. The guide provides information on approved treatment options for wood packaging material, applying the ISPM 15 mark, manufacturing, repairing and reusing wood packaging material, import-inspection procedures, and phytosanitary actions in response to ISPM 15 non-compliance. It also includes several case studies that highlight the diverse ways that countries have approached some of the challenges associated with implementing ISPM 15.

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This document presents guidance to support the implementation of International Standard for Phytosanitary Measures No. 15 (*Regulation of wood packaging material in international trade*). It was created under the auspices of the Secretariat of the International Plant Protection Convention (IPPC) as a component of the *Strategic Framework for the IPPC (2020–2030) – Protecting global plant resources and facilitating safe trade*. This work has been developed and peer-reviewed by selected experts all over the world under the coordination of the IPPC Secretariat with the oversight of the IPPC Implementation and Capacity Development Committee.

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Abbreviations and acronyms

CPM	Commission on Phytosanitary Measures
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
IPPC	International Plant Protection Convention
ISPM	International Standard for Phytosanitary Measures
NPPO	national plant protection organization
WPM	wood packaging material

About this guide

This guide provides comprehensive, yet easy to understand, information to support harmonized implementation of International Standard for Phytosanitary Measures (ISPM) No. 15 (*Regulation of wood packaging material in international trade*), which aims to reduce the risk of introduction and spread of pests associated with the movement of wood packaging material (WPM) in international trade. It discusses the responsibilities of national plant protection organizations (NPPOs) and national legislative considerations and may be used by an NPPO as practical guidance for establishing a national programme for producing ISPM 15-certified WPM in its country. The guide can also be used by the NPPO as a basis for the development of its own procedures tailored to the national context and suggests best practices for ensuring that appropriate procedures are in place and are applied consistently to the production of WPM used for export. In addition, the specific practical guidance provided in the guide is expected to be useful for treatment providers, WPM manufacturers, repairers and remanufacturers, and other stakeholders, to help them to improve compliance with ISPM 15. The guide also describes how the ISPM 15 mark should be used to ensure that WPM that has been subjected to the approved treatments is readily identifiable, thereby facilitating trade.

The guide includes information about the WPM supply chain, applying ISPM 15-approved treatments, and best practices for reusing, manufacturing, repairing and remanufacturing WPM. It discusses the importance of enhancing collaboration with other national agencies working at the border and provides guidance on inspecting imported WPM, evaluating compliance with ISPM 15 and applying phytosanitary actions in response to ISPM 15 non-compliance. The guide also includes several case studies and examples that highlight the diverse ways that countries have approached some of the challenges associated with implementing ISPM 15 in order to manage the pest risk associated with WPM moving in international trade and to facilitate safe trade.

Users of the guide are encouraged to provide feedback on the guide to help strengthen future editions of the guide and other training resources.[1]

[1] Send email to ippc@fao.org

Introduction

Over the past few decades, growing globalization, international travel and trade have led to an increased risk of the introduction and spread of plant pests (hereafter referred to as "pests"). New pest introductions and pest outbreaks are costly, not only to governments but also to industry and consumers. This is because when a new pest becomes established, it is often impossible to eradicate, resulting in significant long-term management and control costs.

An estimated 80 percent of all consignments moving in global trade include some type of wood packaging material (WPM), such as pallets, crates, drums, dunnage and other wooden units that are used to secure, protect or assist in the movement of cargo or a commodity. Wood packaging may be used by virtually any industry and can be associated with virtually any imported consignment, including those containing goods that would not normally be subject to phytosanitary intervention.

Wood packaging is frequently made of raw wood that may not have undergone sufficient processing or treatment to remove or kill pests and therefore becomes a pathway for the introduction and spread of pests. These pests, particularly those organisms associated with heartwood, phloem or bark, can have negative impacts on living trees and forest ecosystems.

Each unit of WPM may be reused many times and it may be shipped to many different countries during its service life. The initial source or origin of any unit of WPM is often difficult to determine. This means that it is not feasible to apply country-specific phytosanitary import requirements for WPM in a global commodity-trading market.

International Standard for Phytosanitary Measures (ISPM) No. 15 (*Regulation of wood packaging material in international trade*) offers a harmonized approach by which countries may address the pest risk posed by the international movement of WPM. It describes treatments that have been recognized by the international phytosanitary community as significantly reducing the risk of introduction and spread of pests that may be associated with WPM. Implementation of this standard is considered to significantly reduce the spread of pests and subsequently their negative impacts on both cultivated and natural forests. However, not only does ISPM 15 describe measures to protect forests from quarantine pest introductions, but it also facilitates trade by replacing the need for phytosanitary certificates with an easily recognized mark, which may be applied to WPM to certify that it has been treated in accordance with the standard and which is accepted almost globally. In this guide, this mark is referred to as the "ISPM 15 mark".

The increased costs associated with the treatment of WPM have generally been more than offset by savings in inspection and phytosanitary certification, as well as savings in the costs incurred through delays in clearing consignments at the point of entry, or costs of refusal, destruction or treatment where the national plant protection organization (NPPO) of the importing country has doubts about the compliance of the WPM associated with a consignment. In brief, the ISPM 15 mark facilitates the verification of treated WPM during inspection anywhere in the supply chain and NPPOs must accept the ISPM 15 mark as the basis for authorizing the entry of WPM without further specific requirements, unless technically justified.

ISPM 15: ***Regulation of wood packaging material in international trade***

This standard describes phytosanitary measures to reduce the risk of introduction and spread of pests associated with the movement of wood packaging material (WPM) in international trade. It also describes the use of a recognized mark to ensure that WPM that has been subjected to the approved treatments is readily identifiable.
www.ippc.int/en/publications/640

The phytosanitary treatments described in ISPM 15 are not designed to provide absolute protection against all wood pests associated with wood packaging. Instead, the standard aims to strike a balance between reducing risk to an internationally acceptable level while applying least-restrictive trade measures. The widespread adoption of the standard, proper application of these measures, and enforcement of the standard would effectively reduce the spread of quarantine pests associated with wood packaging and help mitigate the pest risk worldwide.

1. Implementation of ISPM 15

ISPM 15 describes the phytosanitary treatments that have been recognized by the international phytosanitary community as being effective for the elimination of certain quarantine pests and it specifies that treatments and application of the mark must always be under the authority of the NPPO. ISPM 15 also gives NPPOs the latitude to organize their own authorization programmes and this has led to enormous diversity in the ways that ISPM 15 has been applied in countries around the world, reflecting differences in legal and organizational frameworks.

1.1 RESPONSIBILITIES OF THE NATIONAL PLANT PROTECTION ORGANIZATION (NPPO)

The NPPOs of both importing and exporting countries have specific responsibilities with respect to ISPM 15.

The NPPO of an importing country is responsible for setting phytosanitary import requirements for plants and plant products, including any WPM that may be used to import unregulated goods. These requirements should be clearly and openly available to the NPPOs of exporting countries and their exporting industries. The NPPO of the importing country should also consider other responsibilities related to imports, including:

- developing procedures for inspections of imported WPM, including for the evaluation of mark compliance and authenticity and the presence of bark and live pests (see Chapter 8);
- collaborating with other agencies at the border to apply risk-based inspection procedures to imported WPM to enhance border controls (see section 1.5);
- establishing procedures for handling WPM that is found to be non-compliant, including issuing notifications of non-compliance (see Chapter 9); and
- ensuring that non-compliant wood packaging is decommissioned or destroyed and is removed from the global supply chain (see section 2.3).

The NPPO of an exporting country is responsible for ensuring that its national phytosanitary export systems meet the requirements set out in the standard. The NPPO should develop policy, procedures, and instructional materials and implement any legislative reform required to ensure that the ISPM 15 mark is only applied to wood packaging that has been treated, manufactured, repaired or remanufactured in accordance with ISPM 15. The NPPO should consider its responsibilities related to the production of ISPM 15-compliant WPM, including:

- establishing a national authorization programme to produce ISPM 15-compliant WPM and authorize entities (an "entity" being a person, company or organization) to use the ISPM 15 mark;
- authorizing, registering and accrediting treatment providers, wood packaging manufacturers, repairers and remanufacturers, accreditation bodies and certification bodies, as appropriate (as per ISPM 45 (*Requirements for national plant protection organizations if authorizing entities to perform phytosanitary actions*));
- assigning a unique code to identify each treatment provider, wood packaging manufacturer, repairer and remanufacturer who is authorized by the NPPO to apply the mark;
- establishing verification procedures and supervising or auditing to verify compliance with the national ISPM 15 programme (as per ISPM 47 (*Audit in the phytosanitary context*));
- responding to requests for technical or phytosanitary information from other NPPOs;
- investigating and reporting in response to notifications of non-compliance from other NPPOs; and
- conducting a regular review of the authorization programme, including the provision of updates detailing any changes to requirements and any newly approved treatment options.

1.2 NATIONAL LEGISLATIVE CONSIDERATIONS

National plant protection organizations should ensure that their national legislation governing imports and exports is broad enough in scope to recognize WPM as an article associated with internationally traded commodities, including commodities that do

not pose a pest risk. As WPM is a plant product, the national legislation governing both imports and exports needs to provide the NPPO with appropriate authority to regulate it.

The NPPO should ensure that national legislation recognizes and accepts ISPM 15-certified WPM that is associated with imported commodities. The presence of an ISPM 15 mark on WPM indicates that the internationally accepted phytosanitary measures have been applied and the presence of the mark should replace the need for a phytosanitary certificate. The phytosanitary measures described in ISPM 15 should be accepted by all NPPOs as the basis for authorizing the entry of WPM without further specific requirements. Applying additional phytosanitary measures beyond those described in ISPM 15 is possible, at the discretion of the NPPO of the importing country, but requires technical justification.

On the export side, NPPOs are responsible for overseeing the production of ISPM 15-compliant WPM in their country and for authorizing the use and application of the ISPM 15 mark. Generally, this involves establishing a programme to authorize entities to perform some of the phytosanitary actions related to the production of ISPM 15-compliant WPM. Before deciding to authorize entities to perform phytosanitary actions, NPPOs should ensure that their country's legal framework enables them to authorize, suspend, revoke and reinstate authorizations. Additional information on authorizing entities to perform phytosanitary actions related to implementation of ISPM 15 is provided in Chapter 6.

As a minimum, national legislation should be in place to:

- recognize and accept the presence of an ISPM 15 mark on imported WPM, in lieu of a phytosanitary certificate;
- describe the national ISPM 15 mark (see section 5.2);
- register the ISPM 15 symbol (see section 5.4);
- prohibit any entity from applying the ISPM 15 mark to WPM unless authorized to do so by the NPPO;
- permit entities to apply the ISPM 15 mark where the WPM has been treated in accordance with the standard;
- provide for the NPPO to authorize entities to perform activities related to the production of ISPM 15-compliant WPM, including assigning a unique code to entities that are authorized to apply the ISPM 15 mark, authorizing the use of a specified treatment code, and specifying the period of validity of the authorization;
- provide the authority to inspectors to enter premises to observe the manufacture, repair or remanufacture of WPM, examine or test equipment or machinery used for manufacturing, repairing or remanufacturing WPM, take samples, examine and if required take copies of any documents or records relating to the production of WPM, and take photographs;
- provide for an inspector to remove or require others to remove any ISPM 15 mark for which the inspector has reasonable grounds for believing that it has been applied fraudulently or without appropriate authorization;
- provide for the NPPO to suspend or revoke the authorization of any entity found not to be complying with the provisions of the national ISPM 15 authorization programme; and
- enable an inspector to seize stencils, templates, or other tools or equipment on premises that could be used to apply an ISPM 15 mark fraudulently or without appropriate authorization.

Finally, the NPPO should consider other national regulations, as well as any relevant Commission on Phytosanitary Measures (CPM) recommendations, international agreements or treaties that may be relevant to the application of phytosanitary treatments to WPM as described in ISPM 15. This may include, for example, regulations related to prohibiting or restricting the use of methyl bromide, registering fumigants or licensing treatment providers.

1.3 PHYTOSANITARY CAPACITY

National plant protection organizations should consider the ability of individuals, organizations and systems in their country to perform functions effectively and sustainably in order to facilitate trade and reduce the introduction and spread of pests in association with WPM, in accordance with ISPM 15. This includes ensuring that:

- appropriate operational procedures for implementing ISPM 15 have been established and are followed;
- there are sufficient NPPO personnel with the knowledge, skills, competencies and experience

needed to effectively authorize, register and monitor authorized entities and ensure ongoing compliance with ISPM 15;
- the wood packaging industry, shippers and exporters are aware of the phytosanitary requirements for WPM in international trade and are engaged to ensure their conformity and support;
- adequate technical guidance is available to establish ISPM 15-treatment facilities for WPM; and
- treatment providers have adequate equipment and their staff have the knowledge, skills, competencies and experience needed to apply ISPM 15 treatments effectively and safely and to maintain treatment records.

Strengthening phytosanitary capacity:

- Develop or enhance training programmes for NPPO staff, who may have varying levels of competency.
- Prepare training manuals, operating procedures and written instructions for specific activities.
- Deliver training to NPPO staff.
- Provide overseas or in-country specialist training for NPPO staff to enhance and maintain technical skills.
- Conduct ISPM 15 awareness-raising campaigns aimed at the wood packaging industry, treatment providers, shippers and other stakeholders.
- Enhance collaboration with ISPM 15 stakeholders, such as national wood packaging industry associations and authorized entities.

1.4 NPPO REPORTING ON ISPM 15 IMPLEMENTATION

Exchanging technical and official phytosanitary information is vital to the effective implementation of the International Plant Protection Convention (IPPC) and international standards, such as ISPM 15.

The ISPM 15 implementation web page on the International Phytosanitary Portal provides a means for NPPOs to communicate information on the implementation of ISPM 15 in their countries. This may include the following information:

- whether ISPM 15 has been implemented for both imports and exports;
- whether the ISPM 15 mark is registered in the country;
- a description or graphic representation of the ISPM 15 marks used in the country;
- where to find national legislation or regulations related to ISPM 15 implementation;
- where to find information about the national ISPM 15 programme;
- where to find a list of entities authorized by the NPPO to use the ISPM 15 mark;
- who to contact for more information on ISPM 15 implementation; and
- the date when the information on the website was last updated.

The information provided on this web page is controlled by the individual NPPOs and the IPPC official contact point is responsible for keeping their country's information on the ISPM 15 implementation web page up to date.

NPPOs are encouraged to visit the ISPM 15 implementation web page to review the entry for their country and to view the information provided by other countries: www.ippc.int/countries/all/ispm15.

The International Phytosanitary Portal also includes a list of IPPC official contact points: www.ippc.int/countries/all/contactpoints. The role of the official contact point is to respond to information requests and communicate on phytosanitary issues on behalf of their country. For example, the official contact point may be able to help the NPPO of the importing country to verify the authenticity of ISPM 15 marks (see section 8.4) or to investigate incidents of non-compliance (see section 9.4)

1.5 ENHANCING COLLABORATION WITH OTHER NATIONAL AGENCIES

As already mentioned, the vast majority of consignments moving in global trade include some type of WPM, such as pallets, crates, drums, dunnage and other wooden units that secure, protect or assist in the movement of a cargo or commodity. Many of these consignments consist of goods that do not pose a pest risk and would not normally be targeted for inspection by an NPPO. National plant protection organizations are not the only national agencies that have responsibilities and interests related to international trade and controlling the entry of regulated articles. Customs, port authorities and other national agencies often work in the same space at the border as NPPOs and they may examine consignments not

targeted by the NPPO. They may also, in some cases, examine the same consignments as the NPPO.

Effective border operations are the key to successfully preventing pest introduction and this may be most effective when there is collaboration with other border authorities (e.g. customs, port authorities). Cooperating with other agencies at the border can improve border controls and detections of non-compliant WPM.

In some countries, the NPPO and these other agencies may be governed by different legislation, while in other countries the responsibilities for border activities may be fully integrated. Regardless of the national situation, the development of relationships with other agencies at the border will raise awareness of the pest risk associated with WPM among government authorities, promote compliance with phytosanitary import requirements, and strengthen coordination among all officials examining or handling imported goods.

National plant protection organizations are encouraged to participate in cooperative frameworks between and among various national border agencies to provide a cohesive and coordinated response to the pest risk associated with WPM. Improved collaboration could also include cross-training between different national border agencies or even between NPPOs of different countries.

See **case study 1** *for an example of how an NPPO can use awareness-raising campaigns to enhance collaboration with stakeholders*

Why collaboration matters

National plant protection organizations have a critical role to play in improving ISPM 15 implementation in their country. Often, the focus has been on raising awareness and building capacities among treatment providers and wood packaging manufacturers, repairers and remanufacturers – the people who are directly responsible for implementing ISPM 15 requirements. However, it is important that NPPOs widen their scope of collaboration to include customs officials, customs brokers, freight forwarders, export associations, industry associations, shippers, and others.

A treatment provider shared a story where a large wooden crate that had been treated and marked as per ISPM 15 was damaged by a forklift at the port during loading. The shipper was unaware that wood packaging material (WPM) associated with exported consignments destined for Europe must be treated in accordance with ISPM 15 and must bear the ISPM 15 mark. He replaced the ISPM 15-certified wooden crate with a wooden crate that was not ISPM 15 certified and loaded it into the shipping container. When the consignment arrived at the port of entry of the importing country, the WPM was inspected. The consignment was refused entry because the WPM did not comply with ISPM 15 and there was no ISPM 15 mark. This was a costly lesson for the exporter and shipper and highlighted to the NPPO and the authorized ISPM 15 treatment provider the need to raise awareness and improve coordination among all the stakeholders at the port.

As a result of this incident, the NPPO established a pilot programme to raise awareness about ISPM 15 among stakeholders at this particular port. The pilot highlighted the importance of segregating treated and untreated WPM in loading areas and ensuring that untreated WPM is not used to repair or replace treated WPM in exported consignments. The NPPO designated an area near the port where authorized treatment providers could carry out ISPM 15 fumigations, in order to minimize treatment, loading and shipping delays. The NPPO also placed large signboards at the final exit point under customs jurisdiction stating that all WPM should be treated as per ISPM 15 and marked appropriately before consignments are exported. The pilot was a success and was subsequently expanded to other ports.

2. Wood packaging material supply chain

Wood packaging material is produced in order to support, protect or carry commodities during shipping. Wood offers several advantages over other types of material that might be used to package commodities for shipping: it is natural, renewable, biodegradable, resistant, flexible and economical. Furthermore, it has an intrinsic capacity to be reused, repaired and remanufactured.

There are three main activities involved in producing ISPM 15-compliant WPM: treating, manufacturing and marking. These activities may all be carried out by a single entity or the treatment and manufacturing components may be carried out by separate entities. The new wood packaging is then used to pack the goods in preparation for export. The shipper loads the consignment with its associated wood packaging into a shipping container or conveyance and it is exported.

After the commodity arrives at its destination and is unloaded, the wood packaging units are generally brought to a central location where they can be examined and sorted. If a unit is no longer compliant with ISPM 15, all ISPM 15 marks must be completely obliterated or removed and it may not be reused to transport goods internationally. If the unit is in good shape and appears to be compliant with ISPM 15 then it may be reused to package goods for export. In other instances, the WPM unit may need to be repaired or remanufactured before it can be reused. Eventually, the unit will be in a state where it can no longer be repaired or reused and it should be decommissioned. Chapter 7 provides additional guidance on sorting, reusing, repairing and remanufacturing WPM used in international trade.

Additional guidance about authorizing entities to perform phytosanitary actions related to ISPM 15 may be found in Chapter 6.

Key stakeholders in the wood packaging material supply chain

Wood packaging material manufacturer: A person, company or organization who owns or operates a facility producing new wood packaging material (WPM) and who may be authorized by their NPPO to carry out ISPM 15 treatments and apply the ISPM 15 mark to appropriately treated wood.

Treatment provider: A person, company or organization who applies ISPM 15 treatments to sawn wood (i.e. timber or lumber) or to WPM and who may be authorized by their NPPO to apply the ISPM 15 mark to appropriately treated wood. Treatment providers may operate from a fixed site, often referred to as a treatment facility, or they may be authorized by their NPPO to operate as a mobile treatment provider that travels to various sites to treat timber or WPM.

Recyclers (repairers or remanufacturers) of WPM: A person, company or organization who owns or operates a facility that sorts, repairs or remanufactures used WPM and who may be authorized by their NPPO to carry out repairs to ISPM 15-certified WPM or apply treatments and to apply or reapply the ISPM 15 mark to appropriately repaired or remanufactured wood packaging. Repairers and remanufacturers of wood packaging are regarded in the same way as manufacturers and must obtain authorization from their NPPO before they carry out certified repairs or treatment and either carry forward certification or apply a mark identifying them as the producer of the WPM.

Shippers: A person, company or organization who performs loading operations whereby commodities with wood packaging are loaded into freight containers or conveyances before export. Shippers do not need to be authorized by their NPPO unless they are involved in treating or marking WPM, but they should be aware of the requirement to only use ISPM 15-certified WPM for exported consignments.

Note that, in ISPM 15, a "producer" refers to a manufacturer of WPM, whereas in this guide, a "producer" refers to a manufacturer, repairer or remanufacturer.

2.1 NEW WOOD PACKAGING MATERIAL

Wood packaging is generally a low-margin product, so transportation costs may factor heavily into wood-purchasing decisions. The wood used to manufacture new WPM can be obtained from a variety of sources. Unless the manufacturer has access to standing trees and harvesting equipment, the manufacturer will generally purchase sawn wood from a sawmill, secondary processor, broker, or retailer in their region, and then process it into wood packaging components or into materials that may be used as dunnage. However, the dynamics of the global wood market are constantly changing and, in some instances, it may be economical for manufacturers to use imported wood for the production of WPM.

After harvesting, logs are generally sent to a sawmill for debarking, cutting and grading. Sawmills cut round wood into timber and some of this sawn wood may be used for manufacturing WPM. In many regions, high-grade wood is used for more valuable applications like furniture and cabinetry, while wood packaging manufacturers use a variety of grades depending on the type of WPM (e.g. low-value pallets versus high-end, customized crates), the specific cargo load, and the desired longevity of the WPM. Higher-grade wood may be used to construct higher-end packaging or for complex designs or a longer lifespan, while lower-grade wood may be used in situations where these are not important considerations. Alternatively, when harvesting smaller trees where no high-grade wood is present, all the logs may be sent directly to wood packaging manufacturers that can debark and cut the round wood into packaging components.

ISPM 15 treatments may be applied at various points during the sawing and distribution of the wood or ISPM 15 treatments may be applied after the WPM has been finished and assembled. The specific requirements for each type of treatment (conventional heat, dielectric heat, methyl bromide and sulphuryl fluoride) may be found in Annex 1 of ISPM 15 and additional guidance may be found in Chapter 4.

Manufacturers who do not carry out ISPM 15 treatments may arrange to source treated wood from another authorized manufacturer or treatment provider in their country, or they may source the wood from another country provided there is evidence that the wood has been treated to at least the minimum specification set out in Annex 1 of ISPM 15. Appropriate record-keeping systems and segregation of treated and untreated wood must be in place to show a "chain of custody" and minimize any risk of untreated material being used to manufacture WPM where the ISPM 15 mark is applied.

Although imported wood, including logs, cants or timber, may be used for constructing WPM, the wood must meet the importing country's phytosanitary import requirements and generally a phytosanitary treatment must be applied to the wood before shipping. However, a country's phytosanitary treatment requirements for imported timber may be different from the requirements for WPM described in ISPM 15. Manufacturers may be required by their NPPO to treat the wood or the WPM as per ISPM 15 before they may apply the ISPM 15 mark. Section 5.6 provides additional guidance on applying the ISPM 15 mark.

What is included in manufacturing?

Manufacturing includes all activities involved in the construction of a finished article of wood packaging material (WPM). For example, it includes nailing pieces of timber to construct a frame or support structure, or to construct crates or pallets. Entities that undertake these types of activities are recognized as "wood packaging manufacturers" and should be authorized by their NPPO to produce ISPM 15-compliant wood packaging and apply the internationally recognized ISPM 15 mark.

The following are examples of activities that an NPPO may consider to fall outside the scope of manufacturing and therefore not require the NPPO's authorization:

- using ISPM 15 compliant dunnage to support cargo when loading a freight container or conveyance before export (**note:** the ISPM 15 mark should be visible on each cut piece of dunnage);
- completing the assembly of a wood packaging unit where each separate wood component must be identified with the manufacturer's ISPM 15 mark and no additional pieces of unmarked wood may be used to complete the assembly or brace the goods in the consignment (for instance when boxes or crates are partially assembled to facilitate their delivery to the exporter or when the exporter can only complete the assembly of the WPM after the goods have been loaded (e.g. nailing the lid onto a box or crate)); and
- assembling a wood packaging kit that was produced by an authorized entity and that includes all the wood components needed to assemble a single pallet, box or crate (each wooden component in the kit must be identified with the manufacturer's ISPM 15 mark and no additional pieces of unmarked wood may be used to complete the assembly or brace the goods in the consignment).

2.2 REUSED, REPAIRED AND REMANUFACTURED WOOD PACKAGING MATERIAL

Wood packaging material begins its initial journey when it is first placed under load or otherwise into service and then shipped. When the consignment arrives at its destination, it is unloaded and unpacked. Used wood packaging is valuable, and most units can be reused, so it is typically examined and as long as it continues to comply with ISPM 15 it may be returned back into the supply stream. This means that a unit of wood packaging may be reused many times and is only taken out of service when it can no longer be used for its intended purpose.

The WPM associated with the consignment may be owned by the importer or exporter and reused by them, or the importer may sell the wood packaging to a third party who will sort the WPM and sell it for reuse. In other instances, pallets may be rented and belong to a rental company (e.g. a pallet pool) where ownership of the wood packaging does not change hands and the rental company reclaims it for reuse. Pallet pools and other companies that collect ISPM 15-marked WPM to be sorted and reused, repaired or remanufactured should only do so if authorized by their NPPO.

The NPPO is responsible for putting appropriate controls in place within their national phytosanitary system to apply the principles of ISPM 15 in relation to used WPM. Only authorized entities should be permitted to decide whether ISPM 15-certified wood packaging units should be reused in international trade. Authorized entities should be responsible for examining each unit of wood packaging and evaluating whether it may be reused, repaired or remanufactured, or whether it should be decommissioned. Chapters 6 and 7 provide additional guidance on authorizing entities and on the reuse, repair and remanufacture of WPM, respectively.

Non-authorized entities should not be permitted to return ISPM 15-certified wood packaging to the supply chain for international trade and should be compelled to completely obliterate or remove all ISPM 15 marks. It is important for NPPOs to be aware of the risk posed by unauthorized companies reusing and repairing ISPM 15-marked WPM without removing all ISPM 15 marks.

Reused: A unit of wood packaging material (WPM) that has been marked and treated in accordance with ISPM 15 and reintroduced into service without having been repaired, remanufactured or otherwise altered in any way.

Repaired: A unit of WPM that has had up to approximately one third of its solid wood components removed and replaced. Replacement components, if not exempt, must each have been treated and marked.

Remanufactured: A unit of WPM that has had more than approximately one third of its components replaced. All previous treatment marks must be obliterated and the unit treated before a new mark is applied.

Decommissioned: A unit of WPM that has had all its ISPM 15 marks obliterated or removed and is no longer used for international trade.

2.3 DECOMMISSIONING WOOD PACKAGING MATERIAL

If there is any doubt that all components of a unit of repaired WPM have been treated in accordance with ISPM 15, or if the origin of the unit of WPM or its components is difficult to ascertain, the NPPO should require the WPM to be either decommissioned, re-treated or destroyed.

Decommissioning involves completely obliterating or removing all ISPM 15 marks from the WPM (e.g. by covering with indelible paint or grinding) to prevent it from further use in international trade (Figure 1).

Re-treatment involves obliterating or permanently removing the old marks and applying a new mark after treatment.

Destruction involves secure disposal or destruction of WPM that can no longer be reused. The old WPM may be chipped, ground or pulped and used to make particle board, oriented strand board, fibre panels, handicrafts, mulch, fuel, or animal bedding. Alternatively, it may be burned or disposed of in a landfill.

Figure 1: Example of an ISPM 15 mark obliterated with black paint

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3. Regulated and exempted articles

3.1 REGULATED WOOD PACKAGING MATERIAL

ISPM 15 applies to all types of wood, including wood from coniferous (softwood) and non-coniferous (hardwood, including tropical) species. The standard provides guidance on the establishment of measures to reduce the risk of pests associated with all types of WPM made from this wood that may serve as a pathway for pests that pose a risk, mainly to living trees.

Wood packaging material includes items such as pallets, crates, boxes, cases, drums, spools and reels, packing blocks, load boards, skids, pallet collars, dunnage, and other wooden units that secure, protect or assist in the movement of a cargo or commodity. Packaging material constructed of unprocessed wood in combination with other low-risk material (e.g. plywood, metal) should also be considered a regulated article.

Wood packaging poses a particular challenge for NPPOs since it can accompany almost any imported consignment, including consignments that do not contain regulated articles and would not normally be subject to phytosanitary measures.

Photographs showing examples of regulated WPM may be found in Appendix 1 of this guide.

There are several other types of wood products that move in international trade that are also a potential pathway for the introduction and spread of quarantine pests. Wood chips, logs, fuelwood, timber and other processed wood are not WPM and are outside the scope of ISPM 15. Some countries may require these commodities to be accompanied by a phytosanitary certificate.

3.2 EXEMPTED ARTICLES

The following articles are exempted from ISPM 15, either because the nature of the material itself poses little pest risk or because they have undergone treatment processes that lower the pest risk:

- WPM made entirely from thin wood (6 mm or less in thickness), such as spacers, sawdust, wood shavings and wood wool;
- WPM made entirely of processed wood material, such as cardboard, fibreboard, oriented strand board, particle board, plywood, pressboard, or veneer, or a combination thereof;
- barrels for wine and spirits that have been heated during manufacture;
- gift boxes for wine, cigars and other commodities, made from wood that has been processed or manufactured in a way that renders it free of pests; and
- wood components that are permanently attached to a freight vehicle or freight container during its construction.

There is no ISPM 15 treatment or marking requirement for WPM made completely from these exempted materials. However, WPM that is constructed of both solid wood and processed wood material, or of solid wood and metal, should be constructed using wooden components that have been treated and the

Dunnage

Dunnage is wood packaging material (WPM) used to secure or support a commodity, but which does not remain associated with the commodity (ISPM 5 (*Glossary of phytosanitary terms*)).

Dunnage includes items such as load boards, bracing within cargo containers, and other loose wood used in securing a cargo during transit. For example, dunnage is often used in marine vessels to stabilize or brace cargo during ocean transport. When the cargo is discharged at the port, the dunnage may be separated from the cargo and left at the port or treated as international waste. Some NPPOs consider that dunnage poses a very high pest risk and regulation of dunnage poses a distinct challenge compared to other WPM. For safety and efficiency reasons, it is often difficult to inspect the discharged dunnage. In addition, dunnage often consists of timbers with a large cross-section that are more difficult to treat or that may exceed the allowable size for treatment (e.g. wood exceeding 20 cm in cross-section is too large to be fumigated).

unit should be marked to identify that the WPM is compliant with the requirements of ISPM 15. For ease of marking or legibility, the mark may be applied to the processed wood components of the WPM.

Sawdust consists of the fine particles resulting from the action of the blade sawing the wood.

Wood shavings are very thin slices of wood specifically manufactured for packaging, animal bedding, and so on.

Wood wool is fine curled shavings of wood smaller than wood shavings but larger than sawdust.

Wood packaging material that is less than 6 mm thick poses little pest risk, as it is unlikely to harbour pests.

Wood packaging material made exclusively from processed wood material such as cardboard, fibreboard, oriented strand board, particle board, plywood, pressboard or veneer is considered to pose little pest risk, either because it has undergone processes (e.g. the use of heat, glue, pressure or a combination thereof) that reduce its pest risk to a negligible level or because the components used to create the materials pose little pest risk. Most forest pests are unlikely to be present in the thin layers of wood laminated together to construct sheets of plywood. Material such as oriented strand board and fibreboard are made from small chips of wood glued together under heat, which are unlikely to contain pests.

Wine and alcohol barrels are considered to pose a negligible risk because the process that is used to bend the wood includes the application of heat and steam. Other barrels, for example those used for transporting food or for decorative use, are not exempt and NPPOs should regulate them, as treatments effective in killing pests are not applied to the staves as part of the manufacturing process.

National plant protection organizations need to consider whether certain decorative boxes should be regulated. For example, presentation boxes for wine, spirits, cigars or other high-value articles may be constructed using wood that is not exempt (e.g. wood thicker than 6 mm). These boxes may present a very low pest risk, particularly if they are constructed of thin pieces of high-quality wood that has no bark or if the intended use of the decorative box may reduce the risk. It may be appropriate for NPPOs to evaluate the specific phytosanitary import requirements for these types of articles on a case-by-case basis. However, exporters should be aware that there is a risk that consignments may be rejected during import inspection if the wood packaging is thicker than 6 mm and does not bear the ISPM 15 mark.

Examples of wood components that are permanently attached to a freight conveyance or freight container (i.e. cargo transport unit) may include wooden beams bolted to the floor or sides of a shipping container, or to the interior of a rail car, and racks or containers constructed of wood or wood and steel affixed to the inside of a container. Containers are designed for intermodal transport, so they can be transferred without load break from a container road vehicle to a railway vehicle or loaded onto a container ship. Containers include freight containers, road freight vehicles, railway freight wagons, railway wagons and other cargo transport units. Additional information about the handling and packing of containers may be found in the *Code of practice for packing of cargo transport units* (the CTU Code: IMO, ILO & UNECE, 2014).

Photographs showing examples of exempt articles are provided in Appendix 2 of this guide.

Dunnage

Consignments of sawn wood (i.e. timber or lumber) may be supported by **dunnage** in the form of spacers or blocks. ISPM 15 specifies that in situations where these spacers or blocks are thicker than 6 mm and integrated into the packs of wood (i.e. the same type and quality of wood) the dunnage could be considered part of the consignment and to have been exposed to the same phytosanitary treatment as the wood in the consignment. In these cases, the spacers or blocks are not wood packaging material (WPM) and do not need to be individually marked. However, any spacers or blocks that are loose, rather than being integrated into the pack, must be marked in the same way as other WPM.

4. Phytosanitary measures to manage the pest risk associated with wood packaging material moving in international trade

Wood packaging material that is used to transport commodities during export is a potential pathway for the introduction and spread of pests. ISPM 15 aims to lower the pest risk to importing countries by ensuring that WPM is made of debarked wood and undergoes an approved treatment. These measures are applied to the WPM before export as an alternative to remedial treatments on imports. The approved treatments may be applied either to the WPM units or to the pieces of wood used to manufacture the packaging.

Wood packaging that has been treated in accordance with the requirements of ISPM 15 does not need to be re-treated unless more than one-third of the unit is replaced or repaired, as described in Chapter 7. Otherwise, the initial treatment is considered to be effective for the entire service life of the WPM, the pest risk is considered to have been managed and reinfestation by pests of living trees is considered to be unlikely.

4.1 USE OF DEBARKED WOOD

ISPM 15 specifies that all WPM must be made of debarked wood irrespective of the type of treatment applied. Debarking is intended to reduce the risk that the wood will be infested after it has undergone an ISPM 15 treatment. The risk of infestation is generally low because the remaining bark surface is insufficient to support most insect development and, once debarked, the wood dries sufficiently to lose its suitability as a host for most pests (Naves *et al.*, 2019), although there are some exceptions to this, including termites and certain dry wood borers (e.g. Lyctidae).

For methyl bromide and sulphuryl fluoride treatments, the bark must be removed before treatment, as the presence of bark on the wood may affect treatment efficacy. For heat treatment, the removal of bark may be carried out either before or after treatment. However, when a dimension limitation is specified for a certain type of heat treatment (e.g. microwave dielectric heating), any bark that is present must be included in the dimension measurement.

Debarking is an industrial process in which most of the bark of the harvested tree is removed. Often this is done by metal teeth, knives or chains, which tear the bark from the wood (Figure 2). It is important to note that debarking does not necessarily result in wood that is completely free of bark (i.e. bark-free wood).

The debarked timber that the sawmills supply for the manufacture of WPM should not exceed the tolerances for bark that are specified in Annex 1 of ISPM 15. The size of each piece of residual bark must be no more than 3 cm in width, regardless of the length, or if the residual bark exceeds 3 cm in width, then the total surface area of any individual piece of bark should not exceed 50 square cm.

The manufacturer of the certified WPM is responsible for ensuring that the bark tolerances are met before applying the IPPC mark. Sometimes this may be accomplished through contractual arrangements between WPM manufacturers and raw sawn wood suppliers.

Wood packaging material that does not comply with these bark tolerances or that is not adequately debarked before fumigation does not meet the requirements of ISPM 15 and must not be certified with the ISPM 15 mark. Section 8.2 provides guidance on evaluating whether the quantity of bark present on imported WPM exceeds these tolerances.

Debarked wood has been subjected to any process that results in the removal of bark.

Bark-free wood has had all bark removed, except ingrown bark around knots and bark pockets between rings of annual growth.

Source: ISPM 5 (*Glossary of phytosanitary terms*).

Figure 2: Debarking equipment for hardwood logs

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4.2 APPROVED TREATMENTS

At the time of publication of this guide, the only internationally accepted treatments for WPM are conventional heat treatment (treatment code: HT), dielectric heat treatment (DH), methyl bromide fumigation (MB) and sulphuryl fluoride fumigation (SF). These treatment options, which are described in Annex 1 of ISPM 15, are considered effective against most pests of living trees. These measures have been adopted by the international phytosanitary community because they are efficacious against a range of pests that have been tested and they are technically and commercially feasible.

As new technical information becomes available, existing treatments may be reviewed and modified, and alternative treatments or new treatment schedules for WPM may be adopted by the CPM. If a new treatment or revised treatment schedule is adopted for WPM and incorporated into ISPM 15, material treated under previous treatments or schedules does not need to be re-treated or re-marked.

The NPPO is responsible for specifying or approving treatment schedules, authorizing treatment providers and ensuring that treatment providers are aware of the requirements for treating WPM as prescribed in ISPM 15. The NPPO is also responsible for suspending or revoking the authorization of non-complying treatment providers. The NPPO should maintain a register of authorized treatment providers capable of undertaking treatments in accordance with ISPM 15. Additional information is provided in Chapter 6.

4.2.1 Heat treatments for wood packaging material

Various energy sources or processes may be suitable to achieve the heat treatment schedule specified in ISPM 15. For example, conventional steam heating, kiln-drying, heat-enabled chemical pressure impregnation and dielectric heating (microwave or radio frequency) may all be considered heat treatments provided they meet the heat treatment schedules provided in Annex 1 of ISPM 15.

The NPPO of the country conducting the heat treatment is responsible for authorizing treatment providers and either verifying that treatments are applied in accordance with ISPM 15 directly or delegating this authority to an authorized entity. Continuous

supervision of heat treatments by the NPPO should not be necessary provided that there is a system for continuous measurement of temperature and for ensuring the security of the facility, process and WPM.

General guidance on the application of heat treatments as a phytosanitary measure may be found in ISPM 42 (*Requirements for the use of temperature treatments as phytosanitary measures*).

ISPM 42: *Requirements for the use of temperature treatments as phytosanitary measures*

This standard provides technical guidance on the application of temperature treatments as phytosanitary measures for regulated pests on regulated articles.
www.ippc.int/en/publications/86087

Conventional heat treatment (treatment code for the mark: HT)

Where conventional heat is the chosen treatment option, the fundamental requirement is to achieve a **minimum temperature of 56 °C for a minimum of 30 continuous minutes throughout the entire profile of the wood or WPM**, including at its core. Kiln-drying, heat-enabled chemical pressure impregnation, or other energy sources may be used for heat treatments provided that they achieve the heat treatment specifications listed above. For example, the heat treatment specifications in ISPM 15 may be met by using steam, hot water, or dry heat.

The methods used to measure the internal temperature of the wood may vary. The NPPO may require direct measurement of the core temperature, where temperature sensors are placed directly into the thickest portion of the wood to verify whether the core of the wood has reached 56 °C for 30 minutes. This is typically the simplest way to confirm a successful heat treatment.

Some countries have developed and approved generic heat treatment schedules as an alternative mechanism for verifying that the ISPM 15 heat treatment requirements have been met. These schedules are developed based on a series of test treatments during which the core temperature of the wood at various locations inside the heat chamber has been measured and correlated with chamber air temperature and humidity. The test series must demonstrate that a minimum temperature of 56 °C is maintained for a minimum duration of 30 continuous minutes throughout the entire profile of the wood, even in the coldest part of the chamber. The schedules must also take into account the variability in wood density and the moisture content of the wood and they usually require a condition factor to be incorporated into the overall minimum run times and final temperatures. These generic heat treatment schedules typically require ambient air temperatures to be recorded and matched against a wet-bulb thermometer or another device capable of measuring wet-bulb depression through conversions (i.e. equilibrium moisture content or relative humidity). Minimum treatment times and temperature thresholds are identified and must be met during treatment.

Although heat treating wood packaging to meet ISPM 15 requirements is different from the traditional wood-drying techniques used by the timber industry, these ISPM 15 treatment schedules may be incorporated into kiln-drying schedules. For the kiln-drying to be considered an ISPM 15-approved treatment, the treatment provider would need to keep records that demonstrate that the prescribed time–temperature schedule is met during the kiln-drying process.

Canada's *Technical heat treatment guidelines and operating conditions manual* is a good example of these types of schedules (CFIA, 2022).

Case study 2 *describes how Canada developed generic heat treatment schedules that are used as an alternative to measuring wood-core temperatures for each treatment*

Dielectric heating (treatment code for the mark: DH)

Where dielectric heating (microwaves or radio waves) is used, the stack of wood or units of WPM must be heated to achieve **a minimum temperature of 60 °C for one continuous minute throughout the entire profile of the wood**, including its surface. The prescribed temperature must be reached within 30 minutes from the start of the treatment. In a stack, each piece treated must meet the above requirements.

Dielectric heating raises the temperature of the commodity by subjecting it to high-frequency electromagnetic waves that cause heating by molecular dipole rotation of polar molecules, especially water.

Dielectric heating occurs through the application of electromagnetic radiation over a range of frequencies, specifically microwaves and radio-frequency waves. The applied frequency of the radiation has a direct effect on the depth of penetration. For radio-frequency waves, the depth of penetration far exceeds what might be typical treatment dimensions, but for microwaves, the depth of penetration may be less than or equal to treatment dimensions. Selection of heating equipment should be made accordingly to ensure proper treatment.

Unlike traditional heating techniques, where heat moves via conduction from the surface to the inside of the commodity and where, as a consequence, the surface is the hottest, dielectric heating generates heat throughout the material, including internally, and the heat propagates by convection and conduction outwards. Consequently, dielectric heating tends to result in the inside of the wood being hotter than the surface, because of heat radiation.

The nature of dielectric heating means that systems for measuring and recording temperature need to be compatible with this technology. Examples include thermal imaging cameras, temperature sensors not affected by the electromagnetic fields generated, thermocouples and fibre-optic sensors.

Please note that dielectric heating is a developing technology and specific guidance may not currently exist or is changing quickly at the time of writing this guide.

4.2.2 Fumigation treatments for wood packaging material

Two fumigants, methyl bromide and sulphuryl fluoride, are approved for treating WPM treatments as per ISPM 15.

It is important to check all national and local government rules and regulations about use of methyl bromide and sulphuryl fluoride to ensure that the selected fumigant is approved for use in the intended fumigation location and that national regulations can be met.

Methyl bromide and sulphuryl fluoride are both highly toxic, and exposure to even small amounts must be avoided. Appropriate safety precautions must be taken to avoid poisoning and death.

It is important to note that both methyl bromide and sulphuryl fluoride can also have negative impacts on the environment. For example, the emission of methyl bromide into the atmosphere is considered to deplete the ozone layer and sulphuryl fluoride is a recognized greenhouse gas.

Fumigation should only be undertaken by authorized treatment providers or by the NPPO. Fumigation treatments may be applied either at a permanent treatment structure or in a temporary enclosure at a suitable fumigation site (e.g. shipping containers, warehouses, or under tarpaulin).

Fumigation of WPM is most commonly integrated into the production of WPM that is to be used for international trade, either before its manufacture or after its manufacture but before packing. However, in some situations the fumigant may be applied after packaging (e.g. once the commodity is packaged for dispatch) or just before dispatch (e.g. at centralized locations at a port).

National plant protection organizations and treatment providers should always comply with national and local government regulations covering the personal-protection equipment required during fumigation treatments. Fumigants should meet national pesticide-registration requirements and be approved domestically before use. The NPPO should work closely with other relevant institutions and take into consideration other applicable national legislation and international agreements and protocols.

To the extent necessary, the NPPO should also cooperate with other national regulatory agencies concerned with the development, approval and safety of the fumigation, including the training and certification of personnel conducting the fumigation, the authorization of treatment providers and the approval of treatment facilities.

ISPM 43 (*Requirements for the use of fumigation as a phytosanitary measure*) contains general guidance on fumigation as a phytosanitary measure.

ISPM 43: *Requirements for the use of fumigation as a phytosanitary measure*

This standard provides technical guidance for NPPOs on the application of fumigation as a phytosanitary measure, encompassing treatments with chemicals that reach the commodity in a gaseous state. This standard also provides guidance for NPPOs on the authorization of treatment providers to conduct fumigation. This standard does not provide details on specific treatments with specific fumigants.
www.ippc.int/en/publications/87183

Fumigation with methyl bromide (treatment code for the mark: MB)

National plant protection organizations are encouraged to promote alternative treatments of WPM that are approved in ISPM 15. They should consider the CPM recommendation on the *Replacement or reduction of the use of methyl bromide as a phytosanitary measure* (R-03) before using methyl bromide.

CPM recommendation on: *Replacement or reduction of the use of methyl bromide as a phytosanitary measure*

This CPM recommendation provides guidance to NPPOs on reducing the use of methyl bromide as a phytosanitary measure and finding alternatives.
www.ippc.int/en/publications/84230

Contracting parties to the IPPC may also have obligations under the Montreal Protocol on Substances that Deplete the Ozone Layer (UNEP, 2019). The Montreal Protocol, first agreed in 1987, is a global agreement to protect the stratospheric ozone layer by phasing out the production and consumption of ozone-depleting substances. The Montreal Protocol phases down the consumption and production of the different ozone-depleting substances in a stepwise manner, with different timetables for developed and developing countries.

Methyl bromide fumigation of WPM must be in accordance with the requirements in Annex 1 of ISPM 15.

Wood packaging material containing a piece of wood exceeding 20 cm in cross-section at its smallest dimension must not be treated with methyl bromide.

The minimum temperature for methyl bromide fumigation is 10 °C and the minimum exposure time is 24 hours.

Although methyl bromide is an approved treatment option in ISPM 15, the CPM encourages NPPOs, for the protection of the environment, to reduce the use and emissions of methyl bromide as a phytosanitary measure.

Fumigation with sulphuryl fluoride (treatment code for the mark: SF)

Sulphuryl fluoride is an approved treatment option for WPM and its use must be in accordance with the requirements in Annex 1 of ISPM 15.

Wood packaging material containing wood exceeding 20 cm in cross-section at its smallest dimension must not be treated with sulphuryl fluoride. Wood packaging material with a moisture content higher than 75 percent (dry basis) must not be treated with sulphuryl fluoride.

The minimum concentration specified in the treatment schedule must be achieved either:

- at or above 30 °C over 24 hours; or
- at or above 20 °C over 48 hours.

ISPM 43 recognizes that sulphuryl fluoride is a greenhouse gas. National plant protection organizations are encouraged to mitigate the environmental impacts of sulphuryl fluoride and other fumigants by reducing its use and gas emissions.

4.3 BILATERAL AND TERRITORIAL ARRANGEMENTS

ISPM 15 is intended to harmonize the phytosanitary import requirements for the international movement of wood packaging to avoid unnecessary trade restrictions. If importing countries require measures beyond those described in ISPM 15, they are obligated to provide a technical justification. The technical justification should be based on pest risk analysis with careful consideration of the appropriate level of protection. Although NPPOs may accept measures other than approved ISPM 15 treatments, the ISPM 15 mark must not be used unless all the requirements of the standard have been met.

Establishing bilateral and territorial arrangements for WPM as an alternative to ISPM 15 is possible. For example, the United States of America and Canada have entered into a bilateral agreement that allows the cross-border movement of WPM between the United States of America and Canada without treatment and without the ISPM 15 mark, provided the import documentation states the wood is of either "continental US origin" or "Canadian origin". Wood packaging material is also allowed to move between countries within the European Union (EU), and Switzerland, without being treated – an ISPM 15 mark is not required.

5. The ISPM 15 mark and its application

5.1 PURPOSE OF THE ISPM 15 MARK

The purpose of the ISPM 15 mark is to certify that the WPM that bears the mark has been debarked and subjected to an officially approved and recognized treatment to reduce the risk of introduction and spread of quarantine pests associated with this pathway. The ISPM 15 mark provides a simple and fast way of verifying that a particular unit of WPM has been subjected to a phytosanitary treatment in accordance with ISPM 15.

Not only does the ISPM 15 mark verify that treatment has occurred, but it also provides a mechanism for tracing the WPM back to the country where the treatment occurred and even to the authorized entity responsible for applying the mark. The mark is internationally recognized and facilitates verification during inspection at the point of entry or elsewhere, thereby addressing many of the operational difficulties associated with inspecting and verifying the compliance of individual units of WPM.

The presence of the ISPM 15 mark means that a phytosanitary certificate or other documented evidence of treatment is not necessary. The mark indicates that the internationally accepted phytosanitary measures have been applied. ISPM 15 aims to provide a paperless certification system that allows for the ongoing use of treated WPM with the ability to trace non-compliance through the certification systems of NPPOs.

A compliant ISPM 15 mark replaces a phytosanitary certificate and should be accepted by all NPPOs as the basis for authorizing the entry of WPM without further specific requirements. No further documentation is necessary to certify that phytosanitary treatment has occurred.

Although it should be avoided, some importing countries require a declaration about whether ISPM 15 compliant WPM is present in a consignment so they may determine whether to apply risk-mitigation measures (e.g. inspection, refusal, treatment, disposal) at the point of entry.

5.2 DESCRIPTION OF THE ISPM 15 MARK

The ISPM 15 mark is composed of the ISPM 15 symbol together with codes that identify the country where the mark was applied, the authorized treatment provider, manufacturer, repairer or remanufacturer, and the treatment that was applied.

The ISPM 15 mark is made up of the following required components:

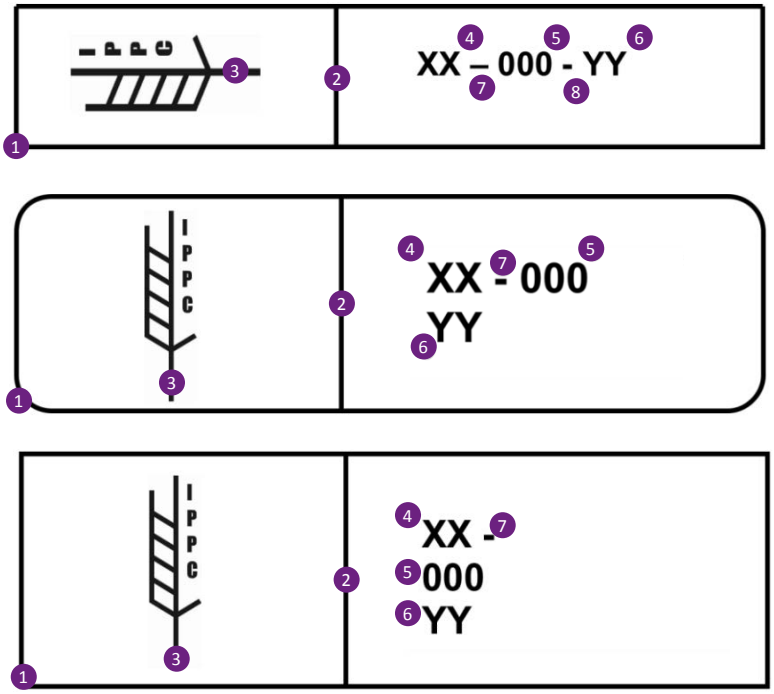
- the ISPM 15 symbol;
- the ISO two-letter country code (www.iso.org/iso-3166-country-codes.html);
- the unique code assigned by the NPPO to identify the WPM producer or treatment provider who is authorized by the NPPO to apply the mark; and
- the IPPC abbreviation or treatment code for the approved measure used (e.g. HT, DH, MB or SF).

The ISPM 15 symbol must not be altered in any way and no variations in the symbol should be accepted (e.g. it is not permitted to place the symbol at an angle or use a mirror image of the symbol). However, variations in the size and layout of the mark should be accepted, provided that they meet the requirements set out in ISPM 15. Annex 2 of ISPM 15 illustrates some acceptable variations in the layout of the required components of the mark, three of which are shown in Figure 3 in this guide.

The mark must be rectangular or square in shape and contained within a border. The corners may be square or rounded. The symbol must always be presented to the left of the other components, with a vertical line separating the symbol from the code components. The code components must always be presented in the same order (i.e. country code, producer/treatment-provider code, treatment code). The country code (shown in the examples as "XX") must be separated by a hyphen from the producer/treatment-provider code (shown in the examples as "000").

The producer/treatment-provider codes are assigned by the NPPO in the country where the entity is located. The number and order of digits or letters vary between countries and some countries include numbers or letters that identify the region where the entity is located. The treatment code (shown in the examples as "YY") must appear after the combined country and producer/treatment-provider codes.

Figure 3: Examples of common layouts of the ISPM 15 mark, showing required elements when codes are presented on one, two and three lines



Notes: (1) border may be rectangular or square shape, corners may be rounded or square; (2) vertical line separating ISPM 15 symbol from codes; (3) ISPM 15 symbol presented on the left side of mark either vertical or horizontal, as shown; (4) country code; (5) WPM producer or treatment-provider code; (6) treatment code (e.g. HT, DH, MB or SF); (7) hyphen after country code; (8) hyphen between producer code and treatment code if they are presented on same line.

Source: **ISPM 15**. 2019. *Regulation of wood packaging material in international trade.* Rome, IPPC Secretariat, FAO. Adopted 2018.

It must appear on a separate line from the country code and producer/treatment-provider code, or be separated by a hyphen if presented on the same line as the other codes.

The current version of ISPM 15 specifies that no other symbols or information should be included within the borders of the mark. If additional information (e.g. lot number, date of manufacture or repair, trademarks of the producers, logo of the certification body) are considered useful to protect the use of the mark on a national or international level, this information may appear outside the borders of the ISPM 15 mark.

However, it is important to note that this was not always the case and that the specifications for the mark were modified when ISPM 15 was revised in 2009. Consequently, the marks found on WPM that was manufactured before 2009 may be inconsistent with the current version of ISPM 15. Wood packaging material that has been treated and marked in accordance with the provisions of a previous version of ISPM 15 should be considered compliant and may be reused for the entire service life of the unit (see section 8.4 for additional guidance on evaluating marks on imported WPM).

ISPM 15 does not prescribe a minimum size or font type for the mark but the mark must be legible and large enough so that it can be easily read by import authorities without the use of visual aids. National plant protection organizations may, however, prescribe the minimum sizes for the marks applied to WPM treated in their country to ensure that officials in importing countries can easily read the mark. Red and orange should be avoided because these colours are often used to label dangerous goods.

Various methods can be used to apply the mark to WPM, including indelible ink stamps, fire branding, or stencilling with indelible paint (Figure 4). To facilitate the use of stencilling, small gaps in the border, the vertical line, and elsewhere among the

Figure 4: Examples of common methods used to apply the ISPM 15 mark

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Notes: Photos show (a) an ink stamp, (b) a roller stamp, (c) a fire brand and (d) a stencil used for applying the ISPM 15 mark to wood packaging material.

components of the mark, may be present. The mark may be applied manually or it may be applied using automated equipment, for example using in-line printers or automated branding machines. The mark must not be hand drawn. The key requirement is that, no matter how the mark is applied, it must be legible, durable and non-transferable.

The mark must also be applied in such a manner that it remains upon the article being certified without being easily removed. Tags or other non-permanent items printed with the ISPM 15 mark must not be used in the place of a permanent ISPM 15 mark. In situations where a permanent mark cannot be applied to the WPM, the NPPO should issue a phytosanitary certificate.

Additional guidance on applying the ISPM 15 mark to WPM, including dunnage, may be found in section 5.6.

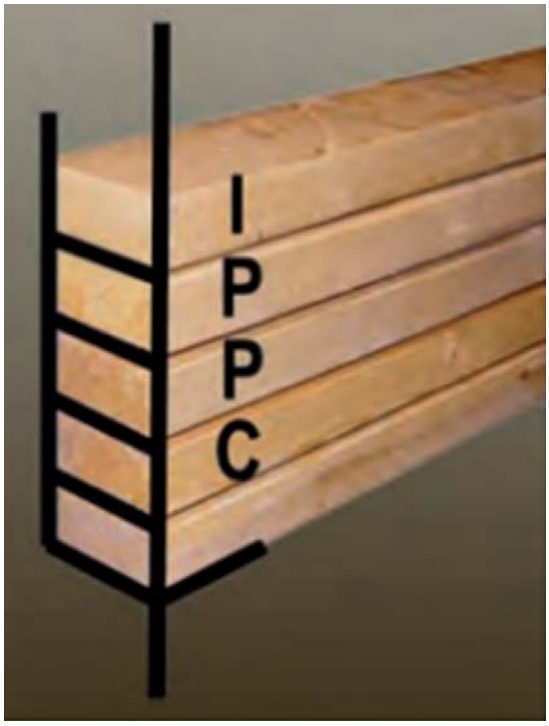
5.3 PROTECTION OF THE ISPM 15 SYMBOL

The ISPM 15 symbol is a key component of the ISPM 15 mark and is recognized worldwide as being associated with certified WPM. The symbol, with its familiar graphic representing a stack of boards (Figure 5), was incorporated into the standard in 2003 and is still in effect today.

The ISPM 15 symbol is owned by the Food and Agriculture Organization (FAO). FAO also administers the International Plant Protection Convention, under which the symbol was developed. FAO is an impartial guardian and promoter of phytosanitary security and maintains the effective and fair use of the symbol in a manner that is in the common interest of all countries. Consolidated ownership of the symbol in one entity ensures a consistent management and monitoring of the symbol worldwide.

Maintaining the integrity of the ISPM 15 symbol is extremely important because it is central to ISPM 15, provides a significant benefit to many companies and national economies, and facilitates international trade. The symbol, therefore, has great economic value and should be protected.

Figure 5: The ISPM 15 symbol, representing a stack of boards



Source: © Cerullo, S. Faraglia, B.C., Burgess, R., Gasparri, C. & Zanuttini, R. 2013. *Pallets and wood packaging – ISPM No. 15: the IPPC standard on phytosanitary measures for wood packaging, including dunnage.* Kindle edn. www.goodreads.com/book/show/21025791-pallets-and-wood-packaging-ispm-no-15

FAO has been entrusted with ensuring that any product bearing the ISPM 15 symbol meets the required characteristics. The ISPM 15 symbol is registered in many countries and used by NPPOs under authority of FAO. The NPPO may authorize entities to apply the ISPM 15 mark to WPM in accordance with the standard and national legislation and regulations. Therefore, the mark may only be used by treatment providers, WPM manufacturers and other entities authorized by an NPPO.

Each contracting party to the IPPC or member of FAO, through its official NPPO, is responsible for the use of the ISPM 15 mark in its territory.

Entities shall not use the ISPM 15 mark without prior authorization by the NPPO or if their authority to use the ISPM 15 mark has been revoked.

When required by contracting parties or members of FAO, FAO will enter into a licensing agreement for use of the ISPM 15 mark.

5.4 NATIONAL REGISTRATION OF THE ISPM 15 SYMBOL

Registration of the ISPM 15 symbol is important for maintaining confidence in the phytosanitary security of consignments moving in the global trade system. It provides the highest level of protection for the ISPM 15 symbol together with effective legal tools if actions against a third party become necessary. Any country where the symbol has not yet been registered should register the symbol.

If the ISPM 15 symbol is not registered, or if the registration has expired, the symbol has no legal protection in that country. Any gaps in registration create a risk of opportunistic or malicious use of the symbol by third parties, with consequent adverse effects on international trade, national economies, and phytosanitary security.

Examples of possible risks associated with non-registration or non-renewal of the symbol are:

- improper, unauthorized or fraudulent use of the mark by entities in the country, leading to possible spread of pests to importing countries; and
- loss of confidence in the system of national and international ISPM 15 certification, negatively impacting trade.

As endorsed by the CPM, national registration and renewal of the registration is handled by FAO. Registration through FAO is easy, efficient and convenient for countries because FAO handles all administrative and legal procedures required for registration. The FAO Legal office, in cooperation with the IPPC Secretariat, handles the registration and renewal processes on behalf of IPPC contracting parties. The NPPO may be called upon to help ensure the registration of the symbol. Other national authorities, such as those for forestry, environment and intellectual property rights, may also need to be involved to ensure proper coordination.

The CPM encourages contracting parties to register the ISPM 15 symbol in their country and to renew any registrations before they expire. The cost of registration or renewal varies from country to country. At the beginning of the registration or renewal process, FAO will inform the contracting party of the corresponding cost and the reimbursement process. The CPM encourages contracting parties to reimburse FAO for the costs incurred in the process of registering or renewing registration of the ISPM 15 symbol in their country.

5.5 CONTROLLING THE USE OF THE ISPM 15 MARK

As described in section 1.2, NPPOs are responsible for putting appropriate legislation in place to authorize the use of the ISPM 15 mark in their country, to decide who can use the mark, and to enforce legislation to ensure that the integrity of the mark is maintained and consistent with ISPM 15.

Treatment providers and wood packaging manufacturers, repairers and remanufacturers who wish to produce ISPM 15-certified WPM must contact their NPPO and may only use the ISPM 15 mark if they are authorized to do so by their NPPO.

The NPPO is responsible for assigning a unique registration number or code to identify the entity who is authorized by the NPPO to apply the ISPM 15 mark. Each authorized entity must have their own equipment for applying the ISPM 15 mark. The mark must include this unique code and conform with the specifications in ISPM 15 and described in section 5.2. Authorized entities must not allow other companies to use their mark.

The NPPO of an exporting country should suspend or revoke the authorization to use the ISPM 15 mark from any entities that do not comply with relevant IPPC principles and standards and should seize or destroy the entity's ISPM 15 stamps (see section 6.7 for additional information).

See **case study 3** *for an example of how an NPPO registers ISPM 15 treatment providers and controls use of the ISPM 15 mark*

National plant protection organizations should provide examples of their national ISPM 15 marks (see section 1.4 and section 8.4 for additional information) to other NPPOs on request and should respond promptly to requests from NPPOs to validate a mark. In the interests of transparency, some NPPOs may decide to publish graphic representations of the ISPM 15 marks that are used in their country.

While lists of authorized treatment providers and wood packaging manufacturers, repairers and remanufacturers can be helpful, it is important to be aware that such lists constantly change and that an entity who is no longer authorized may have been authorized when the WPM was produced. It is recommended that NPPOs develop a system of reporting the use of unauthorized and fraudulent marks within their countries and share this information with other NPPOs and stakeholders (see section 6.4).

Phytosanitary actions may be taken where imported WPM does not carry a compliant ISPM 15 mark or where there is evidence that the mark is fraudulent or unauthorized. These actions may take the form of treatment, disposal or refused entry. Guidance on identifying and reporting cases of non-compliance with ISPM 15 is provided in Chapter 9.

5.6 APPLYING THE ISPM 15 MARK

The NPPO is responsible for authorizing entities to use the ISPM 15 mark. Generally, authorized entities should apply the mark only to WPM that has been constructed with treated wood, or to WPM that has been treated, in accordance with ISPM 15. However, it is common practice in several countries where ISPM 15 marking and heat treatment processes are highly mechanized (e.g. Canada, EU Member States, New Zealand, United States of America) for ISPM 15 marks to be applied before the WPM is treated. In these instances, the NPPO should ensure that effective procedures are in place to prevent untreated, insufficiently treated or incorrectly treated WPM from entering the supply chain.

As described in section 5.2, there are various methods that can be used to apply the ISPM 15 mark to WPM. Regardless of how the mark is applied, it must be visible to inspectors and it must be legible, durable and non-transferable. Usually, applying the mark twice on opposing vertical faces is sufficient. However, in some cases the mark may be applied to multiple locations so that it can easily be seen. On pallets, this could be on an inner face of the vertical blocks or stringers that separate the floors of the pallet, because these may be more visible to an inspector when looking into a container.

The mark can also be applied on components of the wood packaging unit that are not solid wood and that are therefore exempt from ISPM 15 treatments, such as plywood, oriented strand board or particle board. In other words, when a wood packaging unit is constructed of both processed and non-processed wood, the mark may be applied to the processed component for ease of visibility. The application of the mark should be interpreted by NPPOs as confirmation that the entire unit is certified, regardless of the composition of the unit.

Including a lot number, the date of production or the date when changes were made to wood packaging is not required and, as specified in section 5.2, no other symbols or information should be included within the borders of the mark. However, ISPM 15 does make provisions for additional information to be applied adjacent to the ISPM 15 mark if it will help to protect the use of the mark.

For example, the Italian NPPO requires authorized entities to include a lot number (treatment lot number / year of treatment) below the ISPM 15 mark. This code represents an element of traceability that goes back to the date of phytosanitary treatment or the date when the WPM was assembled from treated wood elements (e.g. a kit) and includes the logo of FITOK, the authorized certification body for ISPM 15 in Italy (Cerullo *et al.*, 2013).

Dunnage

Applying the ISPM 15 mark to dunnage

Often the treated wood used for dunnage is cut to final length at the time of loading. National plant protection organizations may need to give special consideration to how these pieces are marked so that the mark is present after cutting. Options include the following:

- Multiple applications of the mark may be made along the entire length of the wood.
  The wood may then be cut to a size where at least one mark (preferably two marks) can remain present on the cut portion. Pieces that are cut to a size less than that necessary to retain one visible mark should not be used.

© B. Peterson/ CFIA, Canada

Wood packaging material bearing multiple ISPM 15 marks, for use as dunnage

- Treated dunnage may be marked in a visible location after it has been cut to size at the time of use, provided that the shipper is authorized by their NPPO to apply the mark.

©BMEL/T. Schroeder

Treated wood dunnage that has been marked after it has been nailed in place

6. Authorizing entities to perform phytosanitary actions related to ISPM 15 implementation

Although it is unlikely to be done on a large scale, an NPPO may directly perform or supervise all activities related to the oversight of ISPM 15 treatments and the manufacture, repair and remanufacture of WPM for export consignments. This could include, for example, directly supervising phytosanitary actions, providing pre-export inspection clearance and carrying out import inspections. However, it is common for countries to outsource some of the operational aspects of implementing ISPM 15, particularly the application of phytosanitary treatments, to third-party entities. In fact, the most common model for ISPM 15 implementation is for the NPPO to carry out some elements directly and to oversee third-party entities that are engaged to perform some of the other activities, such as applying phytosanitary treatments and conducting audits.

Before deciding to authorize entities to perform phytosanitary actions, NPPOs should ensure that their country's legal framework enables them to authorize, suspend, revoke and reinstate authorizations. The NPPO should also consider:

- whether new or increased enforcement or legislative tools are needed for the NPPO to provide adequate supervision of authorized entities and to monitor the manufacture, repair and remanufacture of ISPM 15-treated WPM (see section 1.2);
- whether the NPPO requires additional human or financial resources to carry out authorization, auditing and inspection activities and whether NPPO staff have the knowledge and skills required to develop and administer an ISPM 15 programme and what additional training is needed (see section 1.3); and
- whether the NPPO may enhance collaboration with industry stakeholders, such as industry associations, timber-grading agencies, pallet manufacturers, shippers and exporters (see section 1.5).

Once an NPPO has verified that it has the necessary legal authorities, resources and suitably trained staff, it may decide to establish a programme to authorize entities to carry out specific phytosanitary actions. Additional guidance on establishing an authorization programme and authorizing entities to perform phytosanitary actions may be found in ISPM 45.

ISPM 45: ***Requirements for national plant protection organizations if authorizing entities to perform phytosanitary actions***

This standard provides requirements for NPPOs if they decide to authorize entities to perform specific phytosanitary actions on their behalf.
www.ippc.int/en/publications/89734

6.1 DEVELOPING A NATIONAL ISPM 15 AUTHORIZATION PROGRAMME

An NPPO should only establish an authorization programme for the production of ISPM 15-compliant WPM if it is confident that it will result in effective phytosanitary actions that are delivered with integrity and transparency. The authorization programme should ensure that the authorized entities are accountable to the NPPO for these actions and that phytosanitary security is maintained in a manner that is consistent with the provisions of ISPM 15. Ultimately, the NPPO of the country where the WPM is produced should be confident that WPM that is treated, manufactured, repaired or remanufactured under the authorization programme consistently meets the requirements of ISPM 15 and that the ISPM 15 mark is only applied to WPM that has been treated as per ISPM 15.

It is also important that the NPPO develop an authorization programme that is appropriate for its purposes. This means that the NPPO should begin by clearly defining the scope and objectives of the programme it plans to develop. The roles and

responsibilities of the NPPO, authorized treatment providers, authorized WPM manufacturers, repairers and remanufacturers, and any entities that are authorized to audit or supervise should be clearly laid out. The programme should set the requirements that must be met by an entity to be authorized and it should describe how the NPPO will verify conformity and provide oversight of the production of ISPM 15 WPM.

The NPPO should:

- ensure that treatment providers, WPM manufacturers, repairers and remanufacturers, and any certification and accreditation bodies are aware of the requirements for authorization and their role and responsibilities;
- ensure that authorization is based on verification that the entity has the appropriate infrastructure, including sufficient, adequately trained staff, to consistently meet the programme requirements;
- ensure that each entity enters into a written agreement with the NPPO (or with the authorized certification body) to be authorized to perform specific phytosanitary actions related to implementing ISPM 15; and
- specify the criteria and process for registering authorized entities, maintaining and renewing authorizations, and suspending and revoking authorizations when a critical nonconformity affecting the integrity of the programme is found or when the responsible party does not undertake appropriate action to address the nonconformity to the satisfaction of the NPPO.

The design of the authorization programme is at the discretion of the NPPO, but four models that are commonly used by NPPOs implementing ISPM 15 are shown in Figure 6.

See **case study 4** *for an example of how the NPPO of Zambia has worked to enhance compliance with ISPM 15*

Certification body: A company or organization authorized by the NPPO to audit and certify treatment providers or wood packaging material (WPM) manufacturers, repairers or remanufacturers and recommend them for authorization under the NPPO's wood packaging certification programme.

Accreditation body: An organization authorized by the NPPO to accredit certification bodies to audit and certify treatment providers and WPM manufacturers, repairers and remanufacturers.

6.2 AUTHORIZATION OF ISPM 15 TREATMENT PROVIDERS, WOOD PACKAGING MATERIAL MANUFACTURERS, REPAIRERS AND REMANUFACTURERS, AND CERTIFICATION BODIES AND ACCREDITATION BODIES

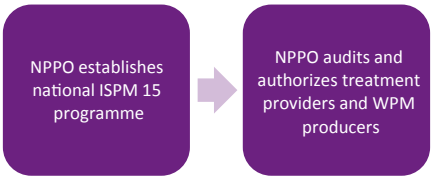
Entities that want to engage in applying ISPM 15 treatments or manufacturing, repairing or remanufacturing ISPM 15-certified WPM must be authorized by the NPPO in the country where the activity is to be carried out. In cases where a company has operations in more than one country, it will be necessary to join the national authorization programme in each of the countries where these activities will be undertaken.

Entities that want to manufacture, repair or remanufacture WPM but do not intend to carry out ISPM 15 treatments may do so by joining their national authorization programme and utilizing wood that has been sourced from a sawmill or other facility that is authorized to perform ISPM 15 treatments. Appropriate mechanisms must be in place to ensure full traceability or "chain of custody". If the ISPM 15 treated wood is sourced from a different country, it should be accompanied by a phytosanitary certificate confirming that the wood was subjected to an ISPM 15 treatment before shipping.

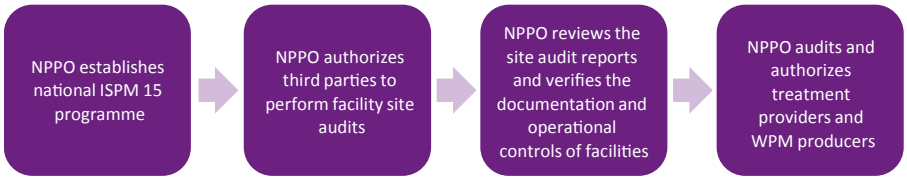
Although the NPPO may delegate some responsibilities to other entities, the NPPO is ultimately responsible for overseeing all aspects of the ISPM 15 authorization programme in its country. The national ISPM 15 authorization programme should clearly communicate the responsibilities of all parties involved and allow the NPPO to verify that WPM is produced in accordance with the requirements in ISPM 15.

Figure 6: Flow chart showing four different authorization models that are commonly used by NPPOs implementing ISPM 15

Model 1



Model 2



Model 3

Model 4

Notes: In model (1) the NPPO carries out all the audits to authorize and maintain the authorization of treatment providers and wood packaging material (WPM) producers; in (2) the NPPO authorizes one or more entities to carry out site audits (inspect facilities and verify equipment) and the NPPO authorizes the treatment providers and WPM producers based on the site audit reports and verification of operational processes and documents; in (3) the NPPO authorizes one or more third-party certification bodies to carry out the audits of treatment providers and WPM producers and authorizes them based on the recommendations of the certification bodies; and in (4) the NPPO authorizes an accreditation body to accredit the certification bodies, who carry out the audits of treatment providers and WPM producers, and the NPPO authorizes entities based on the recommendation of the accreditation body.

Treatment providers and wood packaging manufacturers, repairers and remanufacturers should be responsible for activities such as:

- developing and maintaining documented procedures describing how relevant components of the ISPM 15 authorization programme are implemented (see Appendix 3 for a sample checklist of recommended documented procedures);
- complying with all relevant legislation, safety codes, or licensing applicable to the state or territory in which the treatment is being performed or the WPM is produced;
- establishing an effective traceability system that allows all wood used for producing ISPM 15 certified WPM to be traced back to the authorized treatment provider;
- ensuring that treated wood packaging is segregated from untreated wood in accordance with the authorization programme;
- keeping auditable records and other evidence necessary to document the treatments performed on WPM;
- clearly demonstrating, through stock movement data, spreadsheets, incoming and outgoing invoices or other means, that the amount of raw material purchased is compatible with the volume of treated wood marked with the ISPM 15 stamp;
- ensuring that all staff members responsible for quality-control activities, or involved in the treatment and production of certified WPM, are aware of the requirements of the authorization programme and are appropriately trained in all functions specific to it;
- identifying and providing appropriate employees to assist the auditor (NPPO or certification body) during audits;
- developing and implementing corrective actions to address any nonconformities identified during audits in a timely manner;
- correctly applying the ISPM 15 mark (if applicable);
- ensuring the security of the ISPM 15 marking equipment so that it is not used by unauthorized entities;
- surrendering ISPM 15 marking equipment (e.g. stamps, firebrands, stencils) to the NPPO on request and ceasing all use of the ISPM 15 mark upon withdrawal from the authorization programme or upon suspension or revocation of authorization; and
- performing other activities as specified in the national ISPM 15 authorization programme.

An NPPO may authorize entities to conduct audits of treatment providers or WPM manufacturers, repairers or remanufacturers on its behalf. Auditors should demonstrate that they have the technical and resource capacity required to verify the procedures and phytosanitary actions carried out by these companies. Once authorized, these auditors should conduct audits as agreed with the authorizing NPPO.

Certification bodies (*if applicable*) may be responsible for activities such as:

- developing and maintaining documented procedures describing how relevant components of the ISPM 15 authorization programme are implemented by the certification body;
- reviewing applications to the ISPM 15 authorization programme from treatment providers and WPM producers;
- advising authorized entities of the requirements of the national authorization programme and any amendments to the programme or to ISPM 15;
- conducting paper audits to evaluate documented procedures and verify records;
- conducting site audits to verify the implementation of the documented ISPM 15 operating procedures;
- notifying the NPPO (or accreditation body) in a timely manner of an authorized entity's nonconformity with the requirements of the authorization programme;
- recommending to the NPPO that authorization of an entity be granted, maintained, suspended or revoked; and
- providing written audit reports to the NPPO (or accreditation body) on a predetermined schedule.

The accreditation body (*if applicable*) may be responsible for activities such as:

- developing and maintaining documented procedures describing how relevant components of the ISPM 15 authorization programme are implemented by the accreditation body;
- working with the NPPO to authorize certification bodies;
- ongoing monitoring and auditing of certification bodies;

Dunnage

Although shippers do not need to be authorized by their NPPO if they are not involved in manufacturing, repairing, remanufacturing or treating wood packaging material (WPM), they do need to be authorized if they are to apply the mark to treated WPM (e.g. if treated wood is cut to fit and there are lengths of wood that are no longer marked).

Shippers are responsible for ensuring that only appropriately treated and marked dunnage is used in preparing a consignment for export. Shippers need to ensure that a mark is visible on each piece of dunnage they use to secure the load so as to facilitate any inspection at the point of entry. It is important to note that where separate pieces of dunnage are nailed together during assembly of the consignment for shipping, this is regarded as a "temporary assembly" and not a "composite single unit" and thus each individual component of dunnage, unless it is made using exempted wood material (e.g. oriented strand board, particle board, plywood) should be marked in such a way as to be clearly visible. Shippers have a critical role in ensuring that consignments are not delayed or refused entry based on failure of the dunnage to meet the requirements of ISPM 15.

National legislation may not permit NPPOs or others to intervene and prevent the export of consignments that do not comply with the phytosanitary import requirements of importing countries. However, it should be regarded as "good practice" to encourage shippers, in the event of them being asked to load goods that they find are packed using non-compliant WPM, to warn exporters of the fact and to advise them that the consignment may be liable to interception at the point of entry, with a risk of consequential delays, refusal of entry, and additional costs.

- liaising with certification bodies and the NPPO and exchanging information;
- advising certification bodies of the requirements of the national authorization programme and any amendments to the programme or to ISPM 15;
- notifying the NPPO in a timely manner of an authorized entity's nonconformity with the requirements of the authorization programme;
- recommending to the NPPO that authorization of an entity be granted, maintained, suspended or revoked; and
- providing written audit summary reports to the NPPO on a predetermined schedule.

6.3 AUDITING IN THE CONTEXT OF ISPM 15

Unlike supervision, an audit does not involve continuous observation and direction of activities, but provides an assessment of a specific phytosanitary system, procedure or particular elements of a system or procedure at a given time. Audits are intended to collect objective evidence as to whether the outcomes of the phytosanitary system or procedure conform with the relevant requirements of the NPPO.

Audits to authorize and to maintain the authorization of entities generally consist of two consecutive stages:

- an evaluation of the entity's documented procedures and records to determine whether the supporting documentation and records are in order (sometimes called a paper audit or desktop audit); and
- a site audit to evaluate the entity's ability to deliver all the elements described in their documented procedures.

During audits of ISPM 15 treatment providers and WPM manufacturers, repairers and remanufacturers, the NPPO (or the auditor authorized by the NPPO) should:

- verify that treatments can be performed accurately and consistently within prescribed parameters;
- verify that the wood packaging is constructed from debarked wood and complies with the bark tolerances prescribed in ISPM 15 and described in section 8.2 of this guide;
- verify that the authorized entity's mark complies with the specifications in ISPM 15 and described in section 5.2 of this guide;
- ensure that effective procedures are in place to prevent untreated, insufficiently treated or incorrectly treated WPM bearing the mark from entering the supply chain (e.g. by ensuring that authorized entities apply the mark only to WPM that has been constructed with treated wood or to WPM that has been treated);
- ensure that authorized entities do not transfer their unique mark to anyone, whether they are authorized or not;

- verify that authorized manufacturers, repairers and remanufacturers source treated wood from an authorized supplier;
- verify that an effective traceability system is in place and that records are kept that allow all wood used for ISPM 15-certified WPM to be traced back to the authorized treatment provider;
- verify that the amount of raw wood purchased is compatible with the volume of treated wood marked with the ISPM 15 stamp;
- ensure that records clearly document whether material has or has not been treated;
- ensure that treated and untreated materials that will be used in the construction of WPM are segregated to avoid the incorporation of untreated components into a treated WPM unit;
- make it clear that approvals and inspections are time bound, and all related reports or observations and auditable records (data sheets, checklists, etc.) should be regularly submitted to the NPPO (or authorized certification body, if applicable);
- enable audit and inspection activities to occur at frequencies that routinely verify an entity's conformity and ensure that any corrective actions are implemented effectively;[1]
- ensure that any critical nonconformity is documented and that any corrective actions are addressed in a timely manner;
- ensure that an entity's authorization is suspended or revoked if a critical nonconformity is identified and not immediately corrected;
- ensure that all suspensions and cancelations of authorization are recorded in a manner that allows potential purchasers or users of the WPM to be aware of the change in the entity's status; and
- ensure that treatment records and other records are kept for a minimum period deemed suitable by the NPPO to ensure that adequate tracing can be performed.

Case study 5 *describes the establishment of an ISPM 15-approved heat treatment facility in India*

[1] In this guide, as in ISPM 15, "entities" include the providers of phytosanitary action (e.g. individuals, organizations, enterprises) and, where appropriate, their facilities (such as equipment, laboratories, treatment enclosures).

6.4 REGISTRATION OF AUTHORIZED ENTITIES

Once an entity has been audited and the audit has demonstrated that the NPPO's requirements for authorization have been met, the NPPO may grant authorization either directly or based on the recommendation of an authorized certification or accreditation body. The NPPO should enter into a written agreement with the entity that authorizes them to perform specific phytosanitary actions and should issue a unique code that identifies the authorized entity.

The NPPO should establish and maintain a registration system to record authorized ISPM 15 entities in its territories and track their status. Typically, NPPOs use a list or database that identifies the type of entity (e.g. treatment provider, manufacturer), their unique identification code, the relevant treatment code (HT, DH, MB, SF), their registration status (e.g. authorized, probationary, withdrawn, suspended, revoked), contact information, and so on. This registration system is intended to help NPPOs track registrations and respond to enquiries from other NPPOs. A sample template is provided in Appendix 4.

Many countries share a public list of the companies who have been authorized to use the ISPM 15 mark on the website of either the NPPO or the certification body. In some cases, the list also provides the company's identification code and occasionally it may also specify the phytosanitary activities the company has been authorized to perform. Such lists can be useful because they help exporters to locate local suppliers of ISPM 15-certified WPM for their goods.

However, it is important for the NPPOs of importing countries to be aware that these lists can be out-of-date and incomplete. Consequently, some authorized companies may not appear because the list has not been updated since they were authorized. The NPPO of an importing country should also not automatically reject WPM that bears an ISPM 15 mark showing a producer code that is not included in the list. Some producers may no longer be authorized because, for example, they are no longer in business. However, the WPM that they produced and marked when they were in business will continue to be compliant throughout its service life, unless it is repaired, remanufactured or altered.

The simplest and best way to check whether or not a company is authorized to apply the ISPM 15 mark or to verify whether a mark is fraudulent is to

contact the NPPO of the country associated with the mark. Section 1.4 provides information on where to find appropriate contact information and section 8.4 provides guidance on evaluating mark compliance and authenticity. As discussed in section 5.5, NPPOs are encouraged to develop a system for reporting the use of unauthorized and fraudulent marks within their countries and sharing this information with other NPPOs and stakeholders.

6.5 AUDITS TO MAINTAIN AUTHORIZATION

Audits should be performed to objectively evaluate whether the authorized entity's activities and procedures continue to conform with the ISPM 15 requirements set by their NPPO and to ensure that any corrective actions arising from nonconformities are implemented effectively. The NPPO should determine the appropriate frequency of the audits to maintain authorization, based on the scope and complexity of the phytosanitary actions and the associated level of pest risk. For example, an NPPO may decide to audit a wood packaging manufacturer that purchases treated wood from approved treatment providers less frequently than it audits treatment providers. The frequency of audits may also vary based on the performance of the authorized entity, the results of previous audits, and the nonconformities identified. Unscheduled audits may also be conducted, for instance upon receipt of a notification of non-compliance from an importing country.

Additional information on audits conducted by the NPPO and audits conducted by entities that have been authorized by the NPPO to conduct audits on its behalf may be found in ISPM 47.

ISPM 47: ***Audit in the phytosanitary context***

This standard provides guidance on the roles and responsibilities of the auditor and auditee and the procedures for planning, preparing for, undertaking and reporting the outcome of an audit. It also provides guidance on selecting auditors, establishing the audit frequency, settling disputes over audit findings, and agreeing to financial arrangements between the parties involved.
www.ippc.int/en/publications/91185

6.6 TYPES OF NONCONFORMITY

When the authorized entity does not meet the requirements specified by the NPPO as set out in the authorization agreement, this should be considered as a nonconformity. In contrast, non-compliance usually refers to not meeting phytosanitary import requirements or the requirements of specific phytosanitary measures.

A nonconformity may be identified during audits, supervision, or investigations triggered by notification of non-compliance from an importing country. The type and number of nonconformities identified should be used by the NPPO to determine the status of the entity (authorized, suspended or revoked) and the follow-up audit frequency. If a nonconformity is identified, the NPPO (or the entity authorized to audit or supervise) should require the authorized entity to take corrective action. Nonconformity may be considered a critical nonconformity (section 6.6.1) or other nonconformity (section 6.6.2).

6.6.1 Critical nonconformity

Critical nonconformities immediately impact the integrity of, and trust in, the NPPO's phytosanitary system and require a rapid corrective action to be identified and implemented. The NPPO may consider nonconformities to be critical in situations such as:

- when there is evidence that an authorized entity failed to properly perform authorized phytosanitary actions;
- when a corrective action is not implemented to the satisfaction of the NPPO (or the entity authorized to audit or supervise);
- when there is a failure to implement corrective actions within an agreed time frame;
- when the integrity or impartiality of the entity is shown to have been compromised;
- when there is evidence of fraud committed by the authorized entity; or
- when nonconformities are detected repeatedly.

An entity's authorization to perform a specific phytosanitary action should be suspended or revoked if a critical nonconformity is identified and not immediately corrected. The NPPO should have a system in place to track and manage critical nonconformities.

6.6.2 Other nonconformity

A nonconformity that does not directly or immediately impact the integrity of, and trust in, the NPPO's phytosanitary system should not be considered a critical nonconformity by the NPPO. Corrective actions should still be taken within a time frame specified by the NPPO (or the entity authorized to audit or supervise). Suspension or revocation of the authorization is not needed but may be considered when this type of nonconformity is repeatedly identified or when corrective actions are not taken within the required time frame. An example of this type of nonconformity may be inadequate record-keeping: it does not necessarily mean that the phytosanitary actions were not performed by the authorized entity, but it does show a lack of attention to detail and may be indicative that other errors may be occurring.

6.7 WITHDRAWAL, SUSPENSION, REVOCATION AND REINSTATEMENT OF AUTHORIZATION

Although audits may be conducted by an authorized certification body, the decision to suspend, revoke or reinstate the authorization of an entity rests solely with the NPPO responsible for authorizing the entity.

The NPPO should immediately remove any entity that has withdrawn, been suspended, or had its authorization revoked from the NPPO's register of ISPM 15-authorized entities. In addition, the NPPO should seize or destroy the entity's ISPM 15 stamps.

Suspension: is when the NPPO suspends the authorization of an entity for a specified time in order for the entity to implement corrective action.

Revocation: is when the NPPO cancels the authorization of an entity.

It is recommended that NPPOs maintain a list of all suspended, revoked, or withdrawn treatment providers and wood packaging manufacturers, repairers and remanufacturers. The list should include the date of withdrawal, suspension, revocation or reinstatement.

National plant protection organizations in importing countries that wish to verify information regarding previously authorized treatment providers and manufacturers, repairers and remanufacturers or the status of a particular establishment or registration number, should verify whether this information can be found in publicly available databases (with reference to section 6.4). Alternatively, they may contact the NPPO of the exporting country. The IPPC Secretariat provides a list of official NPPO contacts on its website (www.ippc.int/en/countries/all/contactpoints), as described in section 1.4 of this guide.

It should be noted that all packaging material certified before the date of withdrawal, suspension or revocation that is still in circulation should be considered to meet the requirements of ISPM 15.

An entity that has voluntarily withdrawn from an authorization agreement or has had its authorization suspended and that wishes to have its authorization reinstated should apply to the NPPO or the entity responsible for administration of the authorization programme for reinstatement. When an entity's authorization has been revoked, the NPPO should evaluate if the entity is eligible for a new authorization. The decision on whether to reinstate an entity's authorization should rest solely with the NPPO.

7. Reusing, repairing and remanufacturing wood packaging material

This chapter describes best practices for the sorting, reusing, repairing and remanufacturing of wood packaging that already bears the ISPM 15 mark.

Repairers and remanufacturers of wood packaging should be considered in the same way as manufacturers and must obtain authorization from their NPPO before they are permitted to carry out treatment and apply a mark identifying them as the producer. In fact, it is recommended that all entities involved in sorting, reusing, repairing and remanufacturing wood packaging be encouraged to join their national ISPM 15 authorization programme. This is because all ISPM 15-certified wood packaging should be managed in accordance with the standard and the reality is that many entities process both marked and unmarked wood packaging. As a minimum, NPPOs should ensure that entities involved in these activities have clearly defined processes for handling both marked and unmarked WPM and understand that WPM moving internationally must be ISPM 15-certified.

Even if an unauthorized repairer declares that he or she will not place ISPM 15-marked wood packaging back into the market and that all ISPM 15-marks will be obliterated, this may be difficult to enforce. Consequently, it is possible that used ISPM 15 wood packaging that has been repaired but is not in compliance with the standard could end up with an exporter who may use it in international trade, unaware that it was not compliant with ISPM 15.

Reused, repaired and remanufactured wood packaging presents a challenge for NPPOs, because of the convoluted path that these units take as they move through the supply chain and as custody of the WPM changes. While this adds complexity to how an NPPO administers the ISPM 15 programme, it does not necessarily increase the pest risk of using WPM. Research suggests that the pest risk profile of WPM actually decreases the longer it remains in use (Naves *et al.*, 2019). Consequently, the largest pest risk is from new, raw wood components that are added to a unit of wood packaging when it is repaired or remanufactured.

Despite the drawbacks outlined above, reusing, repairing and remanufacturing WPM is an efficient use of wood materials and sound environmental practice, and should be encouraged whenever feasible.

7.1 SORTING AND DECOMMISSIONING WOOD PACKAGING MATERIAL

After the commodity arrives at its destination and is unloaded, the wood packaging unit is generally brought to a central location where it can be examined and sorted. Before returning WPM to the international supply chain, the authorized entity must examine the unit and determine whether it may be reused, repaired or remanufactured or whether it must be decommissioned. The authorized entity must verify:

- that any bark that is present on the unit is within the tolerances described in Annex 1 of ISPM 15 (see section 4.1 of this guide), regardless of whether the wood packaging was originally produced and treated before the revision of ISPM 15 in 2009;
- the presence of an IPPC mark that complies with ISPM 15;
- the absence of an active pest infestation;
- the absence of any signs that wooden components that were not treated in compliance with ISPM 15 have been added to the unit;
- that the number of ISPM 15 marks on the unit does not exceed the number allowed by the NPPO in the country where the unit is being examined; and
- the absence of any suspicious or non-compliant repairs on the wood packaging unit.

If these conditions are not met, the wood packaging unit is not suitable for reuse or repair and it should be decommissioned. This involves removing or completely obliterating all ISPM 15 marks on the unit. The unit may subsequently be re-treated and re-marked, provided it can be brought into compliance with the bark tolerances allowed. Decommissioned WPM may be used in remanufacturing (see section 7.4).

Examples of the types of questions that an authorized entity may use to evaluate whether a wood packaging unit is suitable for reuse or repair, or whether it should be decommissioned, are provided in Figure 7.

It should also be pointed out that, since there is no reliable tool to determine whether a particular wood packaging unit has actually been treated, those selecting and repairing wood packaging for ISPM 15 purposes cannot take the responsibility for those who originally produced the WPM or carried out the initial treatment.

7.2 REUSED WOOD PACKAGING MATERIAL

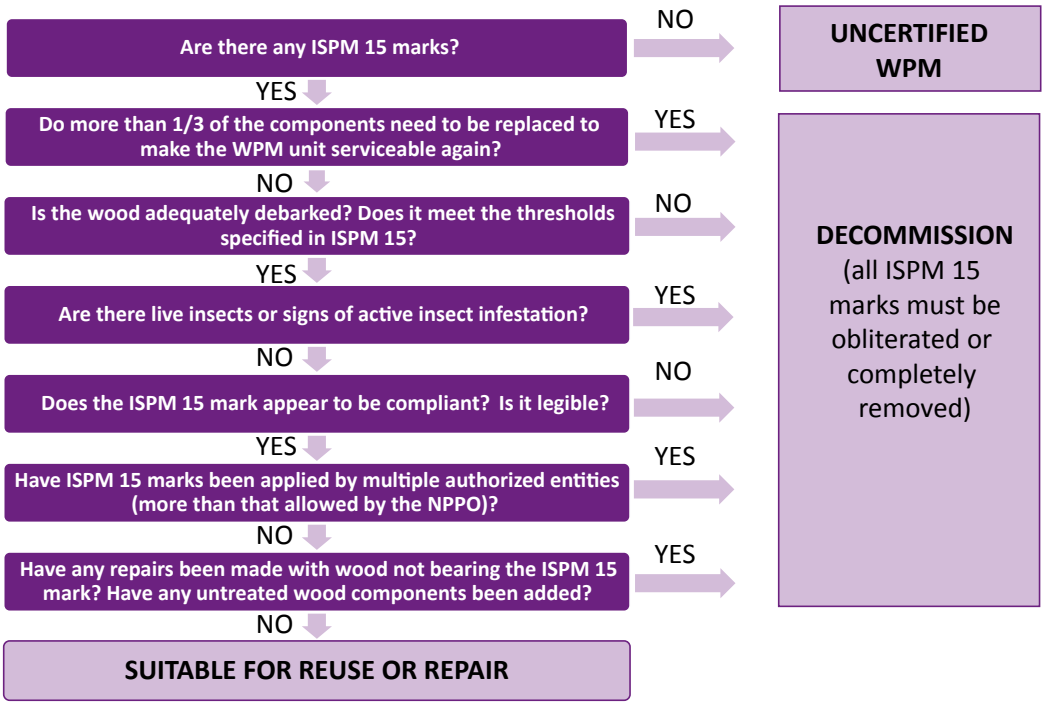
A reused unit of wood packaging is one that has been marked and treated in accordance with ISPM I5 and reintroduced into service without having been repaired, remanufactured or otherwise altered in any way. ISPM 15 allows this type of WPM, if compliant, to move internationally indefinitely without being re-treated or re-marked.

The authorized entity should determine whether the unit of WPM can be reused, repaired or remanufactured, and should decommission units that are not suitable (see Chapter 2). National plant protection organizations are responsible for controlling the reuse of WPM and should provide guidance as to when a wood packaging unit may be reused, repaired or remanufactured and when it must be decommissioned. If it is difficult to verify that no alterations have been made to the WPM, the NPPO should require that the responsible entity decommission it by obliterating or completely removing the existing marks. Should the decommissioned unit need to be used again for export, it must be re-treated and marked according to ISPM 15 in a manner approved by the NPPO.

7.3 REPAIRED WOOD PACKAGING MATERIAL

A unit of WPM in which one-third or less of its components are altered, repaired or replaced (e.g. replacing extensions or bracing on a pallet) is referred to as repaired wood packaging. The unit does not need to be

Figure 7: Sorting wood packaging material



Notes: The flowchart provides examples of the types of questions that an authorized entity may use to evaluate a wood packaging unit in order to determine whether it is suitable for reuse or repair, or whether it should be decommissioned. Decommissioned wood packaging material units may be treated and recertified or they may be remanufactured, provided any remaining bark does not exceed the thresholds specified in ISPM 15.

re-treated provided that all the components used to replace damaged pieces have either been subjected to an approved phytosanitary treatment or made of products that are exempted from ISPM 15, such as plywood, oriented strand board or particle board. Where treated wood is used for the repair, each replacement component must bear the ISPM 15 mark of the authorized treatment provider. The mark of the original certification of the unit should remain on the unit unless the entire unit is re-treated.

This creates challenges for inspectors, because the WPM may bear different marks applied by different authorized parties. This can make it difficult to determine the origin of the packaging and to attribute responsibility if it is found to be non-compliant. To address this challenge, ISPM 15 recommends that NPPOs limit the number of different marks that may appear on a single unit of WPM that has been repaired by an authorized entity. Where this limit is exceeded, NPPOs may require that all ISPM 15 marks be obliterated or completely removed and that the WPM be re-treated and re-marked. National plant protection organizations should clearly communicate their import and export regulations regarding multiple marking to minimize confusion and avoid trade being hindered.

In situations where a country is unable to repair wood packaging as described above, it may consider stipulating that the original ISPM 15 marks be obliterated if any repairs or alterations have been performed. The product must be re-treated and the ISPM 15 mark of the treatment provider can then be applied to the article.

Another challenge may arise if a unit of untreated WPM that has not been ISPM 15-certified is repaired with wood components bearing the ISPM 15 mark. This may make it appear that the wood packaging unit complies with ISPM 15 when it does not.

Where the certification of WPM is in doubt, or where there is doubt as to whether the wood packaging unit or specific components of it have been appropriately treated, the NPPO should ensure that all marks are obliterated to decommission the unit. If the decommissioned unit of WPM is to be further used in international trade, the unit should be re-treated and re-marked.

In addition, NPPOs should carefully evaluate whether demanding the re-treatment of entire units of repaired WPM is appropriate and whether it may encourage those conducting repairs to operate fraudulently outside of the certification system. When feasible and appropriate, NPPOs are encouraged to accept repaired WPM that complies with the requirements of ISPM 15 to meet the objective of encouraging sustainable reuse and to de-incentivize fraud in the reuse sector. The NPPO should carefully review the provisions for repairing WPM in consultation with industry to develop appropriate procedures to meet the requirements described in ISPM 15.

7.4 REMANUFACTURED WOOD PACKAGING MATERIAL

Remanufactured WPM is defined as units of certified or previously certified WPM in which more than one third of the components are replaced, or a unit that has been wholly constructed from recycled wood packaging components or a mix of new and used components. The purpose of remanufacturing is to make the WPM unit serviceable again. If the unit is to re-enter the international supply chain, all previous treatment marks must be permanently obliterated or removed and the unit treated before a new mark is applied.

Wood packaging material that is too damaged to be remanufactured and WPM that cannot be reused without major reworking or resizing must be decommissioned or destroyed.

7.5 OVERSIGHT OF REUSED, REPAIRED AND REMANUFACTURED WOOD PACKAGING MATERIAL BY NPPOs

National plant protection organizations should consider provisions and methods for evaluating whether authorized entities are producing compliant WPM. As it is not practical for NPPOs to supervise the production of WPM, they need to rely on validating production systems and verifying operating procedures to mitigate the risk of non-compliance (refer to Chapter 6). National plant protection organizations should ensure that entities engaged in reusing certified wood packaging have standard operating procedures that are documented, clear and well described (see Appendix 3).

Wood packaging may be reused in international trade if it remains in its original state, bears ISPM 15 marks and the marks remain intact. If these conditions are not met, any remaining marks should be obliterated and the unit can no longer be used for

exports. It is critical for companies that reuse, repair or remanufacture WPM to understand that ANY unit exiting their facility bearing an ISPM 15 mark is their responsibility, and must be handled and processed in a manner that ensures its adherence to certification standards. Staff should also be well trained to ensure that certification standards are met.

National plant protection organizations should ensure that their certification system effectively monitors and oversees the repair or remanufacture of WPM. Monitoring whether replacement of damaged components results in units being considered as repaired rather than remanufactured is a substantial undertaking. At a single facility, during a single production day, significant volumes of units of new wood packaging may be produced along with the alteration of additional volumes of repaired and remanufactured wood packaging. The system should consider that the repair and remanufacture of WPM should not allow any greater potential for the certification of non-compliant WPM than exists with the production of new WPM. Material streams and process flows should be distinct and clearly identified in the facility, with areas of treated and untreated wood being physically separated to maintain the integrity of the certification system.

Non-compliant (in the form of the presence of a wood-infesting pest) WPM that contains a valid ISPM 15 mark may result from:

- the incorporation of untreated wood, including the incorporation of wood removed from units that have not been appropriately treated; or
- the application of the mark to a treated component that is attached to a unit containing untreated components.

Ultimately, NPPOs should ensure that their national ISPM 15 authorization programme focuses on the procedures used by entities to produce ISPM 15 compliant WPM, rather than inspecting individual units to verify that they comply with the specific provisions of the standard.

8. Import procedures

Given the large volumes of WPM moving in trade, contracting parties should try to focus their limited resources on inspecting those consignments that pose the highest pest risk in order to optimize the effectiveness of import inspections and maximize the chance of detecting non-compliant WPM. National plant protection organizations are encouraged to develop an inspection strategy that targets and prioritizes inspection activities based on risk. This means that the quantity of items selected for inspection and the frequency of inspections should be decided based on the results of previous inspections of similar types of commodities from the same origin or exporter. In other words, consignments containing specific types of commodities from origins or exporters with a poor history of compliance should be inspected more thoroughly and more often than those where data collected from previous inspections indicate that the WPM in the consignment is likely to comply with ISPM 15 (see section 8.5).

Such procedures may be used to facilitate the speedy throughput of cargo while ensuring that inspections target the highest risk consignments. Continual monitoring and evaluation of inspection results should be used to ensure that the risk-based inspection procedures keep pace with changes in trade and remain relevant.

Many import authorities rely on the documents accompanying imported consignments as the means of deciding whether a particular consignment is eligible for entry and whether it should be inspected. Packing declarations, shipping manifests, commercial invoices and other entry documentation may serve as a means of identifying those consignments that are accompanied by WPM even if the commodity is not traditionally regulated by the NPPO.

It is strongly recommended that NPPOs do not require specific treatment declarations or treatment certificates in addition to the ISPM 15 mark and existing import documentation, as it may severely impact trade and reduce the utility of the internationally accepted ISPM 15 mark.

The ability to target higher-risk imports for inspection depends on the country's existing legislative framework, inspection resources, inspection data, and training programmes. When making risk-based decisions about which consignments will be subject to import inspection, an NPPO may consider:

- the presence and type of WPM in the consignment (i.e. dunnage, pallets, etc.);
- the country of origin of the WPM or the country of origin of the goods associated with the WPM (considering the potential quarantine pest risk);
- the history of non-compliant wood packaging associated with the country of origin, exporter or importer (where appropriate, NPPOs may issue quarantine alerts and national strategies for phytosanitary measures and actions);
- the types or characteristics of the imported goods associated with the WPM;
- the reliability of previous packing declarations by the importer or exporter;
- the volume and frequency of entry of WPM at a specific point of entry;
- the season in the importing and exporting country; and
- images of the goods in a consignment that may be obtained using non-invasive inspection equipment.

In addition, NPPOs should consider the following when establishing a programme to inspect imported WPM:

- the legislative authorities and procedures needed to identify and stop consignments at the entry point for inspection and any required actions arising from non-compliance;
- training for NPPO staff to identify higher-risk consignments, conduct import inspections and carry out phytosanitary actions related to non-compliance;
- the tolerance levels to be applied and actions to be taken on non-compliant consignments (which will vary with the degree of risk posed by

the non-compliance but may include treatment, disposal, redirection, refusal of entry of the WPM or refusal of both the commodity and the associated WPM);

- procedures for handling unmarked WPM (e.g. the NPPO may take different phytosanitary actions if unmarked wood packaging is found to be infested with pests compared to wood packaging with no signs of living pests);
- the location and safety of the inspection site (noting that most WPM is generally imported in shipping containers from which the consignment needs to be unloaded, and loose wood dunnage is often discharged at berthing areas where inspections may interfere with port activities);
- the equipment and resources needed to inspect the WPM (noting that inspection may require heavy equipment to either discharge the commodity from the WPM or the ability to lift the WPM sufficiently to conduct the inspection); and
- the procedures and tools needed to manage non-compliant consignments (e.g. disposal facilities, secure phytosanitary transportation from the site of inspection to the site of disposal or treatment, treatment facilities).

Case study 6 *describes how Canada manages the pest risk associated with ship-borne dunnage at key marine points of entry*

8.1 IMPORT INSPECTION

National plant protection organizations should provide adequate training to those who are responsible for inspecting WPM so that they can carry out inspections safely and know how to identify WPM units that pose a higher pest risk. Inspection staff should be competent in identifying compliant marks and making appropriate decisions in dealing with non-compliant wood packaging. It is also imperative that they are familiar with the signs and symptoms of potential quarantine pests and are prepared to apply emergency measures if live pests are detected in the WPM.

Inspections are likely to be most effective if the shipping container is unloaded and inspectors have the opportunity to inspect all of the WPM, including those units placed in the centre of the container (Eyre *et al.*, 2018). However, it may be more practical to carry out such inspections at the final destination of the consignments, rather than at the point of entry, because of time and space constraints.

When carrying out an inspection, inspectors should verify that the WPM does not have excessive bark, that it is marked, that the marks are compliant and that it does not contain any pests or signs of living pests. Wood packaging material units that have not been repaired correctly, or that have an excessive amount of bark or a non-compliant mark, are often associated with an increased probability of finding live pests. Signs of an active pest infestation may include finding sawdust inside containers or exit holes in the wood containing frass (insect droppings) or insect galleries.

The presence of living pests infesting the wood, excessive levels of bark, unmarked repairs, or incorrect application of the ISPM 15 mark can be an indicator of a treatment failure or a failure in the certification system of the NPPO of the exporting country. In some cases, however, the discovery of non-compliant WPM may be an indication of fraud.

8.2 EVALUATING BARK PRESENCE

All ISPM 15-certified wood packaging must be constructed using debarked wood. When evaluating wood packaging for the presence of bark, the NPPO should verify compliance according to the tolerances for remaining bark as specified in Annex 1 of ISPM 15 (see also section 4.1 of this guide).

The requirements in ISPM 15 mean that any number of visually separate and clearly distinct small pieces of bark may remain on the wood and the WPM will still be compliant with ISPM 15. However, the size of each piece of residual bark must be no more than 3 cm in width, regardless of the length, or if the residual bark exceeds 3 cm in width, then any individual piece of bark should not exceed 50 square cm.

Import authorities should recognize that the production of wood and the construction of WPM is generally a mechanized process involving a high turnover of product in a very short period of time. It is therefore common that the bark remaining on wood packaging may slightly exceed the tolerances prescribed, particularly on some wood species where the bark is harder to remove.

If inspectors find wood packaging that contains more bark than is allowed, they should take a closer look for evidence of the presence of live pests.

This should include removing the bark and looking for the presence of insect eggs, larvae or adults and recent signs of pest infestation (see section 8.3).

Enforcement activities are most warranted in cases where living pests are found in association with the bark or where multiple non-compliances are observed in a single consignment.

Photographs showing examples of wood that meet ISPM 15 debarking requirements, and photographs of wood that does not, are provided in Appendix 5.

8.3 EVALUATING PRESENCE OF LIVE PESTS

When a living organism is detected on ISPM 15 certified WPM, it could be a result of several factors including inadequate treatment, fraud, or contamination or infestation after treatment. However, finding live insects or recent signs is not necessarily an indication that the wood packaging is non-compliant.

When a living pest or signs of active pest infestation are found on ISPM 15-certified WPM, the NPPO should document what was found with photographs and collect samples so that the organism may be identified. It is important to identify the organism and to record other relevant information, such as the type of WPM, whether it was associated with a repaired component, whether the bark tolerance was exceeded, and all ISPM 15 marks and any other relevant information. This information should be used to distinguish between pests that indicate a failure of the ISPM 15-certification system versus interceptions of contaminating pests and other pests that can infest WPM after treatment. Photographs showing examples of insects and signs of insects found in association with WPM are provided in Appendix 6 of this guide.

Some key forest pests that are known to be present in living trees or in raw wood before the manufacture and treatment of the wood packaging include organisms belonging to the following taxa (Ormsby, 2022):

- **insects** – Bostrichidae, Buprestidae, Cerambycidae, Scolytinae, Siricidae;
- **fungi** – *Heterobasidion* spp., *Ceratocystis* spp.; and
- **nematodes** – *Bursaphelenchus xylophilus* (Steiner & Buhrer) Nickle (Rhabditida: Aphelenchoididae).

ISPM 15 treatments should effectively mitigate the risk of these pests in WPM at the time of treatment. If a living specimen from any of the insect families listed above is found in WPM bearing the ISPM 15 mark, it may indicate a treatment failure, an ISPM 15-certification failure, or fraud.

It is important to note that some of the taxa in these families (e.g. Bostrichidae) may infest WPM after treatment. The NPPO of the importing country should identify the species of insect, consider its life stage relative to the age of the WPM, and evaluate whether the insect could have been present at the time of treatment or whether it is more likely that it infested the wood after treatment. This information may then be used to determine appropriate follow-up actions and reporting.

The design and structure of wood packaging may provide refuge opportunities for contaminating organisms, such as snails, slugs, ants, stink bugs, or egg masses of moths or plant hoppers. These organisms may become associated with any type of WPM, at any point in its service life after it has been treated (NAPPO, 2022). Although the presence of contaminating pests may trigger quarantine actions, they do not indicate non-compliance with ISPM 15.

Other pests that infest WPM after treatment, such as auger beetles, termites or carpenter ants, may also trigger quarantine actions but do not indicate non-compliance with ISPM 15.

It is important to note that the discovery of dead organisms in the wood or traces of old or inactive infestations is not a sign of non-compliance. However, finding recent signs of pest activity or live quarantine pests should result in the application of phytosanitary measures, regardless of whether there is an ISPM 15-compliant mark or not.

8.4 EVALUATING MARK COMPLIANCE AND AUTHENTICITY

ISPM 15 advises that the mark should be placed in a location that is visible when the wood packaging is in use, preferably on at least two opposite sides of the wood packaging unit (see section 5.6). Sometimes, the mark may be applied to a plywood, oriented-strand-board or particle-board component of the WPM for ease of visibility. National plant protection organizations should consider any wood packaging that does not have an ISPM 15 mark to be non-compliant.

ISPM 15 states that the mark must be legible and contained within a solid border line, with a vertical line separating the symbol from the code components (see section 5.2). However, when the mark is applied to wood there may be small gaps in the border, the vertical line and elsewhere among the components of the mark. Such gaps should not be considered a sign of a non-compliant mark unless the mark is not legible. National plant protection organizations should use their discretion in deciding whether a particular mark is legible and may need to look at additional marks on the wood packaging unit or in the consignment before deciding whether a wood packaging unit is non-compliant and poses a pest risk.

When evaluating the authenticity of the ISPM 15 mark, NPPOs should inspect the wood packaging to verify whether the marks comply with Annex 2 of ISPM 15. At the same time, the inspector should also consider the general condition of the WPM, since the presence of living pests, excessive levels of bark or improperly repaired wood packaging may also be indicators of fraudulent use of the ISPM 15 mark.

As mentioned in Chapter 5, an important consideration is that WPM that has been treated and marked in accordance with the provisions of previous versions of ISPM 15 should be permitted to be reused without the need for either re-treatment or reapplication of the mark for the entire service life of the unit. This means that marks on WPM that was manufactured before 2009 may include information that is inconsistent with the current version of ISPM 15. For example, before 2009, NPPOs, producers and treatment providers were permitted to add control numbers or lot codes to the ISPM 15 mark provided these additions were not confusing, misleading or deceptive. In addition, WPM that was constructed before 2009 may have been marked with treatment codes that are no longer in use, such as "DB" (debarked) or "KD" (kiln-dried). Another example is the "MB" code in association with a European country code, which may still be found on WPM that was treated with methyl bromide before 2010, when its use was banned in Europe (Cerullo *et al.*, 2013). The presence of these old codes does not make the wood packaging unit non-compliant and units bearing these treatment codes may continue to be used and reused, regardless of the country of origin, until they are remanufactured or decommissioned.

Photographs showing examples of both compliant and non-compliant marks are provided in Appendix 7 of this guide. Additional photographs are available in Papyrakis & Tasciotti (2017).

If an NPPO suspects that a mark is fraudulent, it is recommended that the NPPO takes photographs, gathers relevant information about the consignment and the WPM, and then contacts the NPPO indicated by the mark and asks them to verify the authenticity of the mark and whether the mark was applied by an authorized entity. National plant protection organizations should consider that there are many reasons why an entity may no longer be authorized and even if an entity is no longer authorized, the WPM that they produced and marked when they were authorized will continue to be compliant throughout its service life, unless it is repaired, remanufactured or altered.

As discussed in Chapter 7, when a wood packaging unit is repaired, each of the solid wood components used to replace the damaged pieces must be subjected to an approved phytosanitary treatment and must bear the ISPM 15 mark of the authorized treatment provider. To make it easier to assess compliance, many NPPOs follow the ISPM 15 recommendation to limit the number of different marks that may appear on a single unit of WPM repaired under their authorization system. For example, Italy allows a maximum of two different ISPM 15 marks on any unit: the mark of the original manufacturer, which may have been applied in any country, and the mark of only one repairer (Cerullo *et al.*, 2013).

8.5 DATA COLLECTION AND REPORTING

National plant protection organizations should develop operational procedures for gathering and recording inspection results, using photographs to supplement the inspection report, collecting specimens and submitting specimens or photographs for identification, reporting inspection results and responding to non-compliances.

Ideally, NPPOs should work with their customs authority and other agencies at the border to gather the data needed to develop and maintain risk-based inspection procedures. As discussed earlier in this chapter, these data should be used to identify those consignments that are most likely to contain non-compliant WPM and those commodities, origins and specific exporters that are likely to pose the highest pest risk.

The NPPO of the importing country could consider developing a simple inspection-report template to

guide inspectors in recording inspection results and to facilitate the collection of high-quality data in a consistent format. Inspectors should be encouraged to take photographs to document key information quickly and accurately and supplement the information in the inspection report.

The following types of data are important to collect when inspecting wood packaging to evaluate compliance with ISPM 15 and for subsequent reporting:

- presence or absence of valid ISPM 15 marks on wood packaging or repaired components – take photographs;
- presence of non-valid ISPM 15 marks or suspected fraudulent marks – take photographs;
- evidence of live pests – submit specimens to laboratory for identification (to genus and species, where possible), but if this is not possible take photographs and notes on what is found (it is vital to determine if the pests found are species that may have been present in the wood before treatment and should have been eliminated by the ISPM 15 treatment or if the species is a contaminating pest or another pest that infested the wood or the WPM after treatment);
- presence of bark – take photographs with a reference object to show the size of the bark found;
- type of WPM (pallet, crate, dunnage, other);
- type of commodity associated with the WPM;
- country of origin;
- name and contact information of the exporter and the importer;
- specific conveyance information, such as vessel name or shipping-container number and dates and location of points of export and entry;
- any other information identifying the wood used in the construction of the WPM (e.g. any logos, company identifiers, grade or quality marks that may have been applied to the wood); and
- regulatory actions taken, such as refusal, treatment or destruction.

9. Guidance for NPPOs when non-compliance is detected at point of entry

9.1 NON-COMPLIANCE WITH ISPM 15

ISPM 15 non-compliance can be associated with a number of scenarios, including:

- WPM (including dunnage) that does not bear an ISPM 15 mark, as described in section 5.2;
- WPM that bears a forged ISPM 15 mark or a mark that is suspected not to be authentic, as described in section 8.4;
- WPM that bears one or more ISPM 15 marks from the same authorized entity but where none of the marks are compliant, as described in section 8.4;
- WPM that has been repaired but where one or more of the replaced wood components does not display a compliant mark, as described in section 7.3;
- a damaged, untreated wood packaging unit that is repaired with ISPM 15 compliant wood components that bear an ISPM 15 mark, as described in section 7.3;
- remanufactured WPM where the original marks were not completely obliterated or removed, as described in section 7.4;
- WPM where the presence of bark exceeds the tolerance levels, as described in section 8.2;
- WPM having live pests that may have been present at the time of treatment (e.g. particularly taxa that are known to be present in raw wood or living trees), as described in section 8.3; or
- signs of an active wood pest infestation that may have been present at the time of treatment (e.g. particularly if the signs are consistent with taxa that are known to be pests of living trees), as described in section 8.3.

The NPPOs of importing countries should carefully review each instance of non-compliance and consider whether it is in fact non-compliance with ISPM 15 or whether it is caused by other events related to the supply chain. It is important to consider a number of points:

- Interceptions of living organisms on WPM do not always indicate non-compliance with ISPM 15. As described in section 8.3, it is important to distinguish between pests that indicate a failure of the ISPM 15-certification system versus interceptions of contaminating pests and other pests that infest WPM after treatment.
- Importing countries should accept the ISPM 15 mark as indicating that WPM has been subjected to an approved phytosanitary treatment in accordance with the standard. The phytosanitary measures described in the standard should be accepted by all NPPOs as the basis for authorizing the entry of WPM without further specific requirements. A phytosanitary certificate or other documents certifying that an ISPM 15 treatment has been performed should not be necessary.
- Wood packaging material that is certified using a phytosanitary certificate or that enters a country under a bilateral arrangement, in lieu of being ISPM 15-certified, and is found to be infested with pests should not be considered as non-compliant with ISPM 15.
- Wood packaging may circulate in the supply chain for many years and NPPOs should consider that the non-compliance they have identified may have arisen in the country of manufacture, repair or remanufacture, rather than in the country of export or transit. In addition, the wood packaging unit may bear different marks applied by various authorized parties and this can make it difficult to determine the origin of the wood packaging and to attribute responsibility for any non-compliance.

9.2 PHYTOSANITARY MEASURES FOR ISPM 15 NON-COMPLIANCE

The NPPO may take emergency action in situations where WPM does not bear the ISPM 15 mark or where the detection of pests provides evidence that the treatment may not have been effective. If the WPM contains any living pests or signs of living pests, the NPPO should consider securing it against the escape of pests (e.g. under tarpaulin or within a closed container, disposal bin or hold) and then treating it before disposal or processing. Additional options for phytosanitary actions could include:

- incineration, if permitted;
- deep burial in sites approved by the appropriate authorities;
- processing;
- other methods endorsed by the NPPO as being effective for the pest or pests of concern; or
- return to the exporting country, if appropriate.

National plant protection organizations should take appropriate steps to treat and destroy non-compliant WPM so that it is removed from circulation. Allowing non-compliant wood packaging to be re-exported may simply shift the pest risk to another country.

As outlined in ISPM 15, the principle of minimal impact should be respected in relation to any emergency action taken. This means that emergency measures should be focused and target only the non-compliant WPM. In practical terms, the NPPO should differentiate between the commodity being traded and the accompanying WPM. Fumigating the entire consignment, including the goods still attached to the wood packaging, is undesirable and may not be justified. The NPPO should make every effort to separate the non-compliant WPM from the goods in the consignment and phytosanitary actions should be targeted at the WPM. In situations where the non-compliance involves consignments that contain WPM of mixed origin or marks, the phytosanitary actions should target the non-compliant WPM and other WPM that bears the same ISPM 15 mark.

The following two scenarios are common scenarios that an NPPO might encounter:

- The non-compliant WPM is detected before it has been released and while it is still under the control of the NPPO. In this scenario, the NPPO should identify a designated area for the temporary detention and storage of the consignment. Regulatory actions should be taken to address the pest risk of the wood packaging. To avoid unnecessary actions to consignments using mixed sources of WPM, the affected part of the consignment should be deconsolidated, if possible, and regulatory actions to manage the pest risk should be focused on the non-compliant WPM.
- The non-compliant WPM is detected and reported to the NPPO after it has been released from quarantine control and has entered the importing country. In this case, the non-compliant WPM might be detected when the consignment is unloaded or unpacked. The NPPO should place the WPM under appropriate regulatory control or containment as soon as possible and apply the same phytosanitary measures as described above to mitigate the pest risk. The NPPO may need to rely on other in-country jurisdictions and resources to assist with these activities.

9.3 PHYTOSANITARY MEASURES FOR OTHER QUARANTINE PESTS

Wood packaging material that is compliant with ISPM 15 may harbour contaminating pests or other pests that may have infested the WPM after treatment, as described in section 8.3. Depending on the type of pest detected, and its regulatory status in the importing country, the NPPO of the importing country may wish to take phytosanitary actions on the imported WPM and the associated goods if deconsolidation is not feasible. These actions may include some, or all, of the following:

- physical segregation of the affected WPM (including the goods if deconsolidation of the goods is not feasible) from non-contaminated WPM until contaminating pests can be removed or destroyed;
- phytosanitary treatments, such as fumigation, cold treatment, heat treatment or application of insecticides, targeting the identified pests;
- physical removal, collection and disposal of the pests during inspection;
- exporting the WPM (including the goods if deconsolidation of the goods is not feasible) back to the country of origin;
- secure disposal or destruction of the affected WPM.

National plant protection organizations should follow the principle of minimal impact in relation to the phytosanitary action taken for the WPM or associated goods. Any actions also need to be consistent with the regulatory status of the pest in the importing country.

9.4 REPORTING NON-COMPLIANCES

It is extremely important that NPPOs document and report instances of ISPM 15 non-compliance as per international obligations. When non-compliance is detected, the NPPO of the receiving country should notify the NPPO in the country from which the ISPM 15 certification originated.

Often, the country of origin of the traded goods is not the same as the country where the wood packaging was treated. National plant protection organizations may consider whether to provide notifications of non-compliance with ISPM 15 to the country of origin of the traded goods, for their information.

Notification of ISPM 15 non-compliance ensures that:

- the NPPO of the exporting country can investigate to identify the cause of the non-compliance and appropriate corrective actions can be applied to avoid reoccurrences;
- NPPOs can maintain the global integrity of ISPM 15;
- trusted trade relationships can be maintained and strengthened; and
- the exporter can obtain compliant wood packaging for future consignments.

To allow the proper investigation of the source of non-compliances, the importing country should provide adequate information, as listed in section 8.5, to the NPPO of the exporting country.

ISPM 13 (*Guidelines for the notification of non-compliance and emergency action*) provides guidance on how instances of non-compliance should be reported to the NPPO of the exporting country. Upon receipt, the NPPO of the exporting country should attempt to trace the origin of non-compliant consignments and notify the NPPO of the importing country of the results of this investigation. Multiple reports of non-compliance may be an indication of a failure in the ISPM 15-certification system at a facility. In this case, the entity responsible for the facility may be required to adjust its production practices or the NPPO may be required to adjust the requirements of the certification programme if the issue is consistent among several approved facilities. Failures at a facility may be caused by factors such as an inadequate application of the treatment, inadequate checks of treatment performance, poor separation of treated and untreated material during construction, or insufficient NPPO oversight of the treatment process. Certification-system failures may be caused by factors such as inadequate requirements, infrequent oversight or insufficient testing of the production practices at facilities.

ISPM 13: *Guidelines for the notification of non-compliance and emergency action*

ISPM 13 describes the actions to be taken by countries regarding the notification of:

- a significant instance of failure of a consignment to comply with specified phytosanitary import requirements, including the detection of specified regulated pests;
- a significant instance of failure of an imported consignment to comply with documentary requirements for phytosanitary certification;
- an emergency action taken on the detection, in an imported consignment, of a regulated pest not listed as being associated with the commodity from the exporting country; and
- an emergency action taken on the detection, in an imported consignment, of organisms posing a potential phytosanitary threat.

www.ippc.int/en/publications/608

10. Case studies

Case study 1

Raising awareness of ISPM 15 in Denmark

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Location and timeline:
Denmark, 2021

Content of case study:
In 2021, the Danish NPPO (the Danish Agricultural Agency) carried out campaigns to raise awareness about ISPM 15 and the pest risk posed by wood packaging. The campaigns targeted two groups: the public and industry and also repairers and remanufacturers of wooden pallets.

The public and industry

This campaign was carried out to raise awareness of the risk of introducing and spreading quarantine pests with wood packaging material (WPM), to draw attention to the symptoms of pest infestation in WPM, and to inform the public and industry about their obligation to report suspected findings of quarantine pests.

The NPPO posted a press release regarding the campaign on its website and sent the press release to several newspapers, television stations, interest organizations and specific professional magazines with forest and nature themes. Brief information was shared on social media. An article describing the pests associated with WPM was also distributed to interest organizations. Several national media picked up the story, including the national TV station TV2 and a major interest organization for Danish industry (the Confederation of Danish Industry). The NPPO's website, which was referred to in the press release, was updated with specific information about WPM, a short film about the importance of using treated WPM in international trade, and information about the risk involved with trade across borders. Citizens and industry could also report findings of quarantine pests via the website.

The campaign demonstrated the importance of NPPOs collaborating with national public media, such as television, radio, newspapers and social media, and with industry organizations to distribute information to the public and to relevant companies. It can be very difficult to catch the media's interest, as WPM may not be of great interest to the general public, but if it is possible to tell a relevant story related to WPM and pests, this will help to secure the attention of the media and they are more likely to distribute the story.

Another lesson learned from the campaign was that if an NPPO runs a campaign or other activities targeted at operators, it is important also to communicate the information to the NPPO inspectors to ensure that the inspectors have the same knowledge as the operators they inspect.

In future, the NPPO may conduct further campaigns to raise awareness among industry and the general public. This could, for example, involve campaigns in companies where there has been a finding of quarantine pests in WPM or campaigns targeted at imports from high-risk areas. The NPPO is also working on partnerships with municipalities, where the NPPO provides information and webinars about quarantine pests and the pest risk associated with WPM.

Repairers and remanufacturers of wooden pallets

The aim of this campaign was to inform repairers and remanufacturers of wooden pallets about ISPM 15 and the EU plant-health regulation related to ISPM 15 (European Parliament & Council, 2016). The NPPO had been informed that some companies that were not authorized by the NPPO repaired and remanufactured ISPM 15 WPM without removing the ISPM 15 mark, as the ISPM 15 mark increases the commercial value of the WPM and its removal constitutes extra work. The campaign was therefore intended to identify and stop these companies repairing and remanufacturing ISPM 15 WPM if not authorized by the Danish NPPO and to ensure that WPM bearing the mark has been treated in accordance with ISPM 15.

The NPPO performed a web search on keywords related to repairing, remanufacturing, selling and buying used WPM, to locate and collect contact information on companies that would potentially carry out activities requiring the company to register as a professional ISPM 15 WPM operator with the Danish NPPO. These companies were informed in writing about provisions and requirements for repairing and remanufacturing WPM in accordance with ISPM 15, and about the reason for the added focus and awareness campaign on quarantine pests associated with WPM. The companies were requested to contact the Danish NPPO if they carried out activities that required registration with the NPPO.

In addition, the NPPO contacted national interest organizations, including the Confederation of Danish Industry, to distribute the information among their members, and also contacted registered professional ISPM 15 operators to inform them about the campaign and about the possibility of reporting companies anonymously through an online, anonymous whistle-blower form.

If the NPPO receives reports of possible illegal ISPM 15 activities, it contacts the company by letter and investigates whether the company needs an ISPM 15 registration to continue with their activities. Denmark, however, does not yet have the legal right to inspect a company's facility based on assumptions of them performing repairs on ISPM 15-marked packaging material.

There is a cost associated with being registered as a professional ISPM 15 wooden packaging operator in Denmark, so it is important to inform these operators that the NPPO is working on registering all companies that should be registered according to ISPM 15 and the EU regulation. To be able to communicate messages that are related to WPM to the professional ISPM 15 wooden packaging operators in Denmark, the NPPO has asked them to join an information group, which is open to all.

The campaign resulted in several companies contacting the Danish NPPO. Of these, five companies sought registration, all of which were repairers or remanufacturers. Initial inspections of the five companies were initiated to ensure the companies' registration and approval to carry out the repairing and remanufacturing of WPM that requires NPPO registration. The campaign also resulted in receiving reports of possible pests in WPM, but without any positive findings of quarantine pests.

The NPPO learned several useful lessons from the campaign:

- The NPPO is not convinced that all companies carrying out activities that require registration as a professional WPM operator have joined the scheme. The NPPO is therefore reconsidering how to find the potential companies and put pressure on companies that are not yet registered.
- It is important to find the right tools to identify companies repairing and remanufacturing ISPM 15 WPM but not authorized by the NPPO. In this campaign, the web search used for identifying relevant companies was not as thorough as expected and in future campaigns the NPPO will use multiple search engines and expand the search words.
- It is crucial to collaborate with industry organizations to distribute relevant information to companies.
- It is important to inform NPPO inspectors about campaigns related to their work, to ensure that inspectors have the same knowledge as the operators they inspect.

Ideally, the campaigns would be repeated every year, to remind the industry and public of the standard and the legislation related to repairing and remanufacturing WPM, the risk of introduction and spread of quarantine pests with international trade of WPM, and the importance of ensuring that all WPM bearing the ISPM 15 mark complies with the requirements of ISPM 15.

Further reading

European Parliament & Council. 2016. Regulation (EU) 2016/2031 of the European Parliament of the Council of 26 October 2016 on protective measures against pests of plants, amending Regulations (EU) No 228/2013, (EU) No 652/2014 and (EU) No 1143/2014 of the European Parliament and of the Council and repealing Council Directives 69/464/EEC, 74/647/EEC, 93/85/EEC, 98/57/EC, 2000/29/EC, 2006/91/EC and 2007/33/EC. *Official Journal of the European Union L*, 317: 1–104.

NPPO web page for reporting findings of quarantine pests:
https://lbst.dk/tvaergaaende/plantesundhed/laes-mere-om-og-anmeld-karantaeneskadegoerere-biller-og-planter

Short film on the NPPO website about the importance of using treated WPM in international trade:
https://lbst.dk/tvaergaaende/plantesundhed-sammen-sikrer-vi-sunde-planter/har-du-tjekket-din-traeemballage

NPPO webinar for teaching employees who work in parks and cemeteries about quarantine pests:
https://lbst.dk/tvaergaaende/plantesundhed-sammen-sikrer-vi-sunde-planter/partnerskaber-om-sunde-planter-i-din-kommune

NPPO web page for anonymous whistle-blowing:
https://lbst.dk/tilskud-selvbetjening/indberet/whistle-blower-ordning

Case study 2

Using generic phytosanitary heat treatment schedules to meet ISPM 15 requirements in Canada

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Location and timeline:

Canada, since early 2000s

Content of case study:

The Commission on Phytosanitary Measures of the International Plant Protection Convention adopts ISPMs to protect plant resources from the spread of invasive pests moving in global trade. ISPM 15, originally adopted in 2002, specifies minimum treatment requirements for wood packaging material (WPM) and describes a wood packaging marking system to facilitate exports of WPM constructed from solid wood (softwood and hardwood) around the world.

When applying conventional heat treatments, the fundamental requirement is to achieve a minimum temperature of 56 °C for a minimum duration of 30 continuous minutes throughout the entire profile of the wood, including its core. This temperature can be measured by inserting temperature sensors in the core of the wood. Alternatively, treatment schedules may be developed by completing a series of test treatments and measuring the core temperature of the wood at various locations inside the heat chamber. These temperatures are then correlated with air temperatures in the chamber, taking into account the moisture content of wood and other parameters (such as species, thickness of wood, air-flow rate and humidity). The tests must demonstrate the air temperature required to ensure that a minimum temperature of 56 °C is maintained for a minimum duration of 30 continuous minutes throughout the entire profile of the wood.

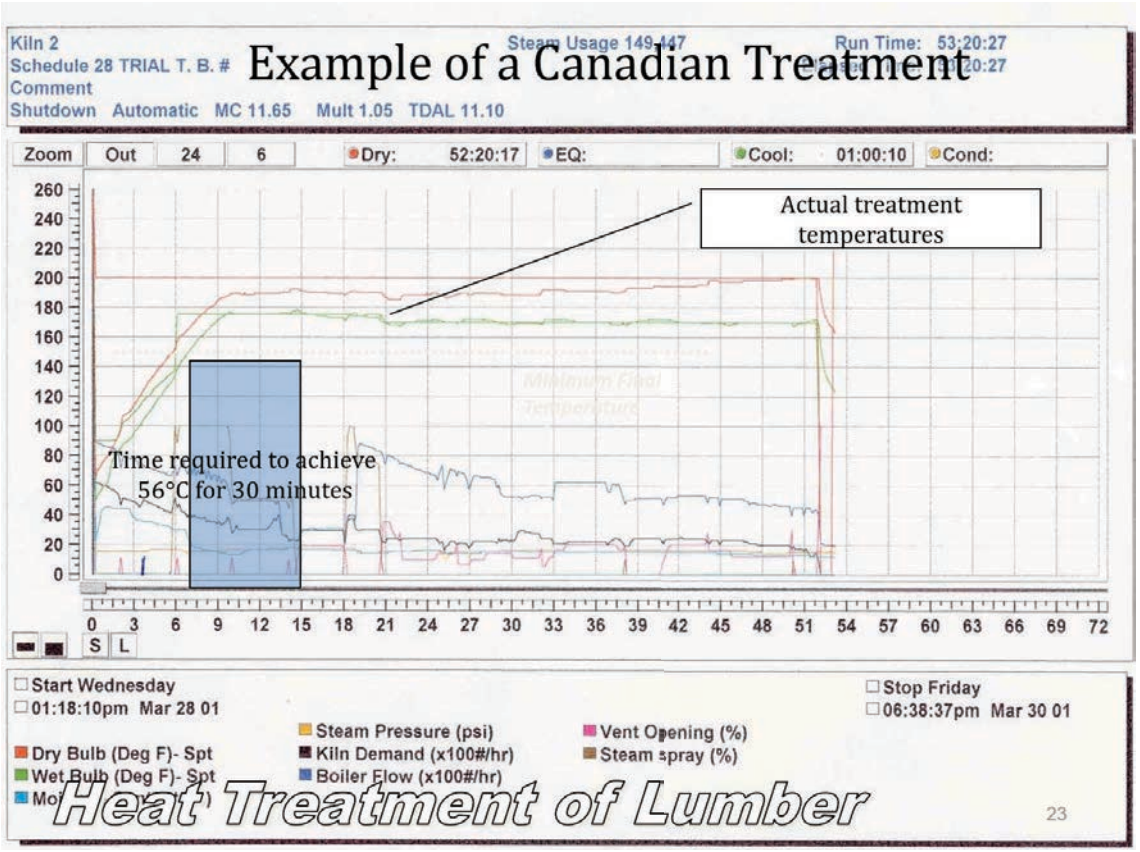
When ISPM 15 was adopted in 2002, Canadian facilities that were authorized to produce heat-treated WPM were operating under site-specific, tested and approved treatment schedules. However, designing and testing site-specific schedules can be costly, especially for smaller facilities.

The Canadian NPPO (the Canadian Food Inspection Agency) worked with the company Forintek (now known as FPInnovations) and the Canadian Forest Service to develop generic heat treatment schedules to meet ISPM 15 requirements, based on data gathered from testing the core temperatures of softwood and hardwood lumber (timber) subjected to heat treatment. The aim was to provide generic schedules that could be applied to any treatment chamber.

The use of prescribed generic schedules requires specific operating conditions within the heat chamber and allows for an alternative to inserting probes to measure wood core temperatures for each treatment. The generic options that have been developed correspond with industry production and allow for the measurement of ambient air temperatures within the treatment chamber. As the schedules are generic, it is recognized that overtreatment is achieved, making the use of the schedules reliable and safe.

Over time, specific options for different types of chambers (e.g. kilns for drying, kilns for retaining moisture) were developed and transposed into several schedules that correspond with the general operating architecture of most kiln types in Canada. For each of the schedules, production requirements are specified, including requirements for air flow, temperature sensors, fan reversals, dry and wet bulb sensors, final treatment temperatures and maximum thickness of the timber. The generic schedules are published in the NPPO's heat treatment manual (CFIA, 2022). As new technical and scientific data become available, the document is updated and new schedules are added.

The development of generic heat treatment schedules has been instrumental in the implementation of



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Example of a heat treatment chart for Canadian sawn wood showing that heat treatment is usually a small part of the normal operating process for an industrial kiln (highlighted area).

Notes: The X-axis in this chart is time in hours and the Y-axis is temperature in degrees Fahrenheit (56 °C is equivalent to 133 °F)

ISPM 15 in Canada. The good relationship between the NPPO, the Canadian Forest Service, FPInnovations and the WPM industry also allows for constant dialogue and continuous improvement of those schedules.

Further reading

Allen, E.A. & Humble, L.M. 2002. Nonindigenous species introductions: a threat to Canada's forests and forest economy. *Canadian Journal of Plant Pathology,* 24(2): 103–110.

CFIA (Canadian Food Inspection Agency). 2022. Technical heat treatment guidelines and operating conditions manual, 8th revision. In: *CFIA guidance document repository.* [Cited 26 July 2022]. https://inspection.canada.ca/plant-health/forestry/exports/ht-program/pi-07/eng/1383841840107/1383841890825

European Commission. 1992. Commission Directive 92/103/EEC of 1 December 1992 amending Annexes I to IV to Council Directive 77/93/EEC on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community. *Official Journal of the European Communities L,* 363: 1–65.

NAPPO (North American Plant Protection Organization). 2014. *Review of heat treatment of wood and wood packaging.* NAPPO Science and Technology Document ST 05. 35 pp. https://assets.ippc.int/static/media/uploads/resources/review_of_heat_treatment_of_wood_and_wood_packaging_english.pdf

Smith, R.S., ed. 1991. *The use of heat treatment in the eradication of the pinewood nematode and its vectors in softwood lumber.* Report to the Task Force on Pasteurization of Softwood Lumber. Vancouver, Canada, Forintek Canada Corporation. 72 pp.

Case study 3

Registering ISPM 15 treatment providers in Bahrain

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Location and timeline:

Bahrain, 2021

Content of case study:

Within the framework of Bahrain's accession to the International Plant Protection Convention in 1971 and its commitment to implementing the ISPMs adopted by the Commission on Phytosanitary Measures, Bahrain is committed to implementing the requirements of ISPM 15 by developing programmes for licensing facilities specialized in treating wood packaging material (WPM) using the approved treatment methods described in ISPM 15.

Activities undertaken and roles of key stakeholders

The NPPO of Bahrain (the Plant Health Section of the Ministry of Municipalities Affairs and Agriculture):

- provides guidance to stakeholders on the requirements of ISPM 15, the various treatment methods and how to access information about them through the International Phytosanitary Portal;
- determines the technical and administrative requirements necessary for obtaining a treatment license;
- makes site visits to verify the technical capacity and efficiency of each treatment facility applying for a license and those in charge of it;
- issues and renews licences for companies and facilities to carry out treatments in accordance with the requirements of ISPM 15;
- approves the ISPM 15 mark and its contents (the symbol, a country code, a producer or treatment-provider code, and a treatment-code abbreviation); and
- monitors the implementation of the licenced activities by:
  - following-up on the periodic reports submitted by companies and treatment providers on treatments being carried out,
  - conducting field visits when necessary, and
  - receiving proposals and complaints from the users of treatment services (clients) to verify the treatment providers' conformity and commitment to work in accordance with ISPM 15 and improve performance.

Companies licensed to conduct treatment in accordance with ISPM 15 (treatment providers):

- prepare an indicative work guide that contains the information and instructions necessary for carrying out approved treatment methods;
- obtain and install the necessary equipment and devices to carry out the treatment process (if not already installed), calibrate it and follow safety and security precautions;
- designate a qualified technician to manage the work of the treatment unit;
- commit to conforming with the requirements of ISPM 15 and controlling the use of the mark, including limiting the use of the mark exclusively to the company and marking treated material only;
- prepare reports on all treatment activities and submit them periodically to the NPPO;
- stand prepared for any field visits by NPPO specialists, made as and when necessary; and
- take full responsibility for any nonconformities or disputes with any party.

Treatment users (clients):

- verify the requirements of the importing country, including any additional requirements to be made for the WPM to be exported, and agree to the treatment provider implementing them;
- verify the treatment procedure and markings on the WPM to be exported, after receiving them from

the treatment provider and before shipping them to the importing country, and ensure that they comply with the requirements of the importing country; and
- report any complaints or suggestions related to treatment operations to the NPPO.

Results

The use of the international mark for WPM has been approved in accordance with the requirements of ISPM 15 for ten companies as follows:
- four heat treatment companies;
- three companies that produce WPM from wood previously heat treated in the country of origin (chain of custody);
- two methyl bromide fumigation companies; and
- one sulphuryl fluoride treatment company.

These companies have the technical and operational capacity to apply ISPM 15 successfully, with users (companies, institutions and bodies) in Bahrain being reliant on this when exporting their commodities on treated WPM.

Lessons learned and areas for improvement

- A clear mechanism is documented and in place. This has helped companies to conform with the requirements and has helped the NPPO when issuing the licenses.
- The responsibility of each stakeholder is clear, particularly the responsibility of the NPPO for facilitating trade and handling complaints regarding exports.

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ISPM 15 heat treatment chamber in Bahrain

- Raising awareness is a critical part of the NPPO's job. The NPPO distributed an ISPM 15 data sheet to the Bahrain Chamber of Commerce and Industry to keep the customers benefiting from the service (users) well informed about their rights and responsibilities.
- The Plant Health Section circulated a questionnaire to measure the satisfaction of users, and the results showed a high level of satisfaction. However, there is a need to intensify communication with users to encourage them to report any complaints to the NPPO or submit proposals related to treatment operations to improve service delivery.

Future activities

Plans for future activities include conducting training courses for both companies licensed to provide treatment services and the beneficiary companies (users) of services.

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Preparing to fumigate wood packaging material in Bahrain

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Fumigating wood packaging material in Bahrain

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ISPM 15-certified wood packaging material in Bahrain

Case study 4

Enhancing compliance with ISPM 15 in Zambia

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Location and timeline:

Zambia, Copperbelt Province, 2007–2022

Content of case study:

Zambia is the second-largest copper producer in Africa after the Democratic Republic of the Congo and the eighth-largest copper producer globally. Copper generates three-quarters of export earnings (Moore, 2014). The mining sector, cable manufacturing companies, and cotton-lint-spinning companies use wood packaging material (WPM) to ship their products across borders. However, before ISPM 15 adoption in Zambia, wood-treatment facilities, such as kilns, were not calibrated to meet ISPM 15 requirements. Furthermore, there was no proper monitoring system to ensure that WPM had been subjected to an ISPM 15-approved treatment method. Zambia recognized these challenges as a potential pathway for introducing insects and pathogens associated with wood and timber and recognized the impact of improperly treated WPM in international trade. The adoption of ISPM 15 provided a regulatory framework to tackle the problem.

The adoption of ISPM 15 allowed IPPC contracting parties, including Zambia, to regulate WPM, which is frequently used in international trade, to ensure that it undergoes sufficient treatment to prevent infestations associated with raw wood (Sekeli and Phiri, 2002). Zambia officially began to implement ISPM 15 in 2005. The Zambian NPPO (the Plant Quarantine and Phytosanitary Service) devised a strategic programme to train targeted companies, suppliers and users of WPM in export consignment. The training aimed at enhancing compliance with ISPM 15 to avoid interruption to trade.

The NPPO has developed a treatment manual and standard operating procedures for the registration and certification of solid-wood treatment facilities by incorporating the requirements outlined in ISPM 15. Operators or owners of WPM treatment facilities must apply for registration in the first instance and renew their registration annually. The treatment facilities are assessed for conformity by NPPO inspectors before first registration or annual renewal. The assessment includes inspection of equipment, assessment of staff involved in the treatment, record-keeping, and segregation of treated and untreated wood. When a treatment facility does not meet ISPM 15 requirements, the owner or operator is given 30 days to address the gaps.

After developing the treatment manual and standard operating procedures, the NPPO conducted training workshops for suppliers, companies and users dealing with WPM to train them on how to conform with ISPM 15 and set up treatment facilities or buy WPM from registered treatment facilities. By 2006, Zambia had successfully registered eight heat treatment facilities in the Copperbelt Province – the "timber belt" of Zambia.

Future plans

Since the adoption of ISPM 15, Zambia has not recorded any cases of non-compliance, which the NPPO attributes to the enhanced level of conformity by the registered WPM treatment facilities used by the mining companies to export copper. However, areas of improvement include continuous awareness of ISPM 15 requirements and encouraging the setting up of dielectric heat treatment facilities to complement the typical conventional heat treatment facilities. There is also a need to develop a monitoring system to ensure that all WPM conforms to ISPM 15. However, the NPPO has deployed inspectors at all active border points to ensure that both exported and imported consignments using WPM comply with ISPM 15.

The immediate plans are to incorporate ISPM 15 into the Plant Pests and Diseases Act, Chapter 233 of the Laws of Zambia, which governs the operations of the NPPO of Zambia, taking into account the experiences of other African countries that have already provided for ISPM 15 in their national regulations and laws (Papyrakis and Tasciotti, 2019). Furthermore, the NPPO plans to enhance border post surveillance and create greater awareness through planned meetings and workshops.

Further reading

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Case study 5

Establishing a treatment facility for ISPM 15-approved treatments in India

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Location and timeline:

Tamil Nadu, India, 2020–2021

Content of case study:

The private sector plays a crucial role in the movement of goods in international trade and in conforming with the regulatory requirements of national and international agencies. This case study focuses on the establishment of a treatment facility in India from the perspective of an accredited wood packaging treatment agency, outlining the processes and procedures followed by the agency to become a registered provider of ISPM 15-approved treatments.

In developing countries such as India, responsible agencies such as the Indian NPPO (the Directorate of Plant Protection, Quarantine & Storage) relentlessly guide exporters and treatment providers in following the appropriate processes and procedures for ISPM 15-approved treatments. In India, an expert team from the NPPO visits and audits facilities in a time-bound manner and facilitates the registrations for approved treatments.

Fumigation Services Pvt Ltd (FSPL) provides treatment services to clients using both fumigation and heat treatment. The fumigation facility was established in 1984 and the heat treatment facility (forced hot-air treatment) was set up in 2008 in the state of Tamil Nadu. This case study shares FSPL's experiences of the approval procedures in India, with a particular focus on heat treatment.

Under the guidance of the NPPO, treatment facilities are set up according to the following steps:

- design of the treatment facility;
- local authority approvals (industry-related and environment-related);
- application for registration with the local authorities and the NPPO;
- audits and inspections;
- development and implementation of standard operating procedures;
- internal checks and documentation;
- submission of monthly records and reports to the NPPO;
- registration; and
- treatment operations.

Based on the guidance provided by the NPPO, which was largely based on ISPMs and India's National Standards for Phytosanitary Methods (NSPMs), FSPL successfully addressed the above points. The whole process, from the initial design stage to the initiation of treatment operations, took approximately one year.

The following details relevant to compliance with ISPM 15 summarize the level of involvement needed to establish such a facility in India:

- The heat treatment chamber was designed and constructed to meet the specifications published under NSPM 9 (Directorate of Plant Protection, Quarantine & Storage, 2017).
- The Indian NPPO provides a detailed account of how to apply and register. The application and follow-up process is available on a public platform (https://plantquarantineindia.nic.in/PQISPub/html/standards.htm), but FSPL also found that consultations with the experts at NPPO were very helpful. The guidelines provided illustrate the step-by-step process required to achieve a successful registration and receive approval.
- To encourage treatment providers in this business, the NPPO leads and guides applicants through all the steps, whether it be the application step, audit or a follow-up to address concerns to conform with ISPM 15 and NSPMs related to treatment of wood packaging material.
- All the units registered for treatment have to pass a mandatory performance test in order to be certified. This includes calibration and an actual

test treatment, which is part of the audit work conducted by the NPPO.

- The NPPO conducts special training for the staff of FSPL and has certified approximately 124 staff to conduct the treatment.
- The NPPO issues a certificate of accreditation and a unique identification number to trace the treatment unit and operator, which is helpful in all matters related to treatment nonconformity and non-compliance of consignments.
- Once a facility is registered, the initial consignments are monitored by the NPPO to ensure that treatments are applied safely and as recommended, which FSPL found to be helpful and to enhance its confidence as a treatment provider.

As of September 2021, FSPL were able to treat around 15 000 consignments, which amounts to approximately 1 million tonnes of wood coming from various exporters or clients. The treatments provided by the facility were about 98 percent successful. All such treatments are recorded on a log sheet and shared with the NPPO during audits or revalidations of the facility.

Overall, FSPL have found the experience of establishing a treatment facility to be quite exciting, involving – as it does – both science and business as well as creating job opportunities for people in remote areas. However, while the procedures set by the NPPO are straightforward and leave no chance of nonconformity on the part of the treatment provider, it is observed that ISPM 15 has an overarching impact that is relevant to stakeholders beyond the capacity and control of NPPOs, such as customs authorities, exporters of non-agricultural products, customs-handling agencies, and transporters. Stronger efforts and coordination may be needed, therefore, to minimize the likelihood of nonconformity as a whole.

Based on their experience, FSPL strongly believes that ISPM 15, together with NSPMs in the Indian context, is highly relevant in curtailing pest movement with international trade and helps national and international agencies charged with plant protection and trade facilitation to deliver their mandates.

Further reading

Directorate of Plant Protection, Quarantine & Storage. 2017. *Guidelines for certification of forced hot-air treatment facilities (FHAT) for wood packaging material.* National Standard for Phytosanitary Measures No. 9. Faridabad, Ministry of Agriculture & Farmers' Welfare, Government of India. 39 pp. https://plantquarantineindia.nic.in/PQISPub/pdffiles/Certification_Standard_for_HT.pdf

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Applying the ISPM 15 mark in India

© FSPL/Johnson Chacko

Preparing to fumigate wood pallets under gas-proof sheets or covers

© FSPL/Johnson Chacko

Wood pallets sealed under gas-proof sheets or covers

Case study 6

Managing the pest risk associated with ship-borne dunnage in Canada

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Location and timeline:

Canada, 1998–2022

Content of case study:

Canada considers that ship-borne dunnage poses a very high pest risk. The Canadian NPPO (the Canadian Food Inspection Agency) published a directive outlining the entry requirements for wood packaging material (WPM), including ship-borne dunnage, in 1998 (CFIA, 2016). The directive was updated to align with the requirements of ISPM 15, which was first adopted in 2002 and revised in 2009. Wood packaging material with presence or signs of live wood-boring pests, presence of bark, or absence of the ISPM 15 mark is considered non-compliant.

Before 2008, Canada allowed compliant ship-borne dunnage to be unloaded at ports but non-compliant dunnage was refused entry and had to be left on board the ship and secured in a manner that prevented pests from escaping. However, the storage of non-compliant dunnage on board was rarely verified, mostly because such verification is complex and presents work-safety risks. Disposal of non-compliant ship-borne dunnage was possible through agreements with the Canadian NPPO or the Canadian Border Services Agency.

Over the years, it became apparent that non-compliant dunnage was often detected among discharged dunnage piles in Canadian ports without the required agreement. In addition, inspecting discharged dunnage piles proved to be unsafe and difficult. In 2008, the Canadian NPPO decided to restrict entry of all dunnage into Canada. For the phytosanitary and logistical reasons mentioned above, all ship-borne dunnage discharged in Canada was considered non-compliant and had to either remain on the ship or be disposed of under ad hoc agreements.

Making no distinction between compliant and non-compliant dunnage, however, provided a poor incentive to source ISPM 15-compliant dunnage. Canada's NPPO therefore wanted to find a way to promote the use of ISPM 15-compliant dunnage while allowing non-compliant dunnage to be safely discharged in Canada all year round.

The NPPO consulted extensively with stakeholders to develop this programme and in 2020 the NPPO, Canadian Border Services Agency and industry reached a consensus on the best way forward.

The newly adopted programme combines robust pest-mitigation measures with a flexible and easy-to-apply approach that also promotes and encourages the use of ISPM 15-compliant dunnage. Under this new programme, dunnage can be discharged all year long at Canadian port terminals where NPPO-approved preventive control plans are in place. The preventive control plan describes the procedures used to manage pest risk during discharge, storage, transport and disposal of ship-borne dunnage. Under the programme, discharged dunnage must be disposed of using an NPPO-approved disposition method, such as incineration, industrial processing or, in some cases, heat treatment. The programme also integrates elements that enhance enforcement capacities by the NPPO, thus promoting the use of compliant ship-borne dunnage.

The new programme introduces high-risk and low-risk periods for dunnage disposal, with specified dates based on pest risk assessment (e.g. winter is considered a low-risk period for pest introductions in most parts of Canada).

During high-risk periods, all discharged dunnage must be stored in such a manner as to prevent pests from escaping. The dunnage may be stored for a maximum of 72 hours after completion of discharge and

then it must be safely moved to a NPPO-approved facility to be disposed of as per the NPPO-approved preventive control plan. The reuse of dunnage is not permitted during high-risk periods.

During low-risk periods, restrictions regarding storage time limit do not apply, provided all discharged dunnage is disposed of before the end of the low-risk period. When the dunnage is segregated and traceability is maintained, compliant dunnage can be reused in another vessel, provided certain conditions are met.

Under the new programme, port terminals that are approved under the programme must visually monitor the discharged dunnage and must notify the NPPO if non-compliant dunnage is detected. Another new requirement is for ship operators or owners to let the NPPO know at least 96 hours in advance of their intent to discharge ship-borne dunnage into Canada. These notifications enhance the NPPO's inspection capacities, which in turn allows for better enforcement and thus a stronger incentive for ship operators or owners to source compliant ship-borne dunnage.

The Canadian NPPO is confident that, in the future, data will show that the industry is handling dunnage in a way that minimizes the pest risk. Consequently, the discharge of non-compliant dunnage should be reduced and should be properly detected and managed, resulting in a programme that appropriately addresses the risk posed by ship-borne dunnage while promoting safe trade.

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Pile of discharged dunnage in a Canadian port

© Canadian Food Inspection Agency/Simon Drouin

Example of ship-borne dunnage use

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EXAMPLES OF ONLINE INFORMATION SOURCES AND INFORMATION-EXCHANGE PLATFORMS

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- Phytosanitary systems – ISPM 15 implementation: www.ippc.int/en/core-activities/capacity-development/phytosanitary-system/ispm-15-implementation
- IPPC official contact points and country information on implementation of ISPM 15: www.ippc.int/en/countries
- Contributed resources: www.ippc.int/en/core-activities/capacity-development/guides-and-training-materials/contributed-resource-list

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- PI-007: Technical heat treatment guidelines and operating conditions manual (En, Fr): https://inspection.canada.ca/plant-health/forestry/exports/ht-program/pi-07/eng/1383841840107/1383841890825

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Definitions

The definitions below are sourced from the IPPC *Glossary of phytosanitary terms* (ISPM 5) and include only those glossary terms that are most relevant to this guide. The complete and updated glossary is maintained at: www.ippc.int/en/publications/622. The glossary is updated annually based on decisions taken by the Commission on Phytosanitary Measures of the International Plant Protection Convention. The definitions below are accurate as of October 2022.

Bark
The layer of a woody trunk, branch or root outside the cambium

Bark-free wood
Wood from which all bark, except ingrown bark around knots and bark pockets between rings of annual growth, has been removed

Chemical pressure impregnation
Treatment of wood with a chemical preservative through a process of pressure in accordance with an official technical specification

Containment
Application of phytosanitary measures in and around an infested area to prevent spread of a pest

Contaminating pest
A pest that is carried by a commodity, packaging, conveyance or container, or present in a storage place and that, in the case of plants and plant products, does not infest them

Country of origin (of a consignment of plant products)
Country where the plants from which the plant products are derived were grown

Debarked wood
Wood that has been subjected to any process that results in the removal of bark. (Debarked wood is not necessarily bark-free wood.)

Dunnage
Wood packaging material used to secure or support a commodity but which does not remain associated with the commodity

Emergency action
A prompt official operation undertaken to prevent the entry, establishment or spread of a pest in a new or unexpected situation not addressed by existing phytosanitary measures

Emergency measure
A phytosanitary measure established as a matter of urgency in a new or unexpected phytosanitary situation. An emergency measure may or may not be a provisional measure

Entry (of a consignment)
Movement through a point of entry into an area

Fumigation
Treatment with a chemical agent that reaches the commodity wholly or primarily in a gaseous state

Heat treatment
The process in which a commodity is heated until it reaches a minimum temperature for a minimum period of time according to an official technical specification

Inspection
Official visual examination of plants, plant products or other regulated articles to determine if pests are present or to determine compliance with phytosanitary regulations

Lot
A number of units of a single commodity, identifiable by its homogeneity of composition, origin etc., forming part of a consignment

Official
Established, authorized or performed by a national plant protection organization

Packaging
Material used in supporting, protecting or carrying a commodity

Pathway
Any means that allows the entry or spread of a pest

Pest
Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products. Note: In the IPPC, "plant pest" is sometimes used for the term "pest"

Pest risk (for quarantine pests)
The probability of introduction and spread of a pest and the magnitude of the associated potential economic consequences

Pest risk analysis (agreed interpretation)
The process of evaluating biological or other scientific and economic evidence to determine whether an organism is a pest, whether it should be regulated, and the strength of any phytosanitary measures to be taken against it

Phytosanitary action
An official operation, such as inspection, testing, surveillance or treatment, undertaken to implement phytosanitary measures

Phytosanitary certificate
An official paper document or its official electronic equivalent, consistent with the model certificates of the IPPC, attesting that a consignment meets phytosanitary import requirements

Phytosanitary import requirements
Specific phytosanitary measures established by an importing country concerning consignments moving into that country

Phytosanitary measure (agreed interpretation)
Any legislation, regulation or official procedure having the purpose to prevent the introduction or spread of quarantine pests, or to limit the economic impact of regulated non-quarantine pests

Phytosanitary procedure
Any official method for implementing phytosanitary measures including the performance of inspections, tests, surveillance or treatments in connection with regulated pests

Phytosanitary security (of a consignment)
Maintenance of the integrity of a consignment and prevention of its infestation and contamination by regulated pests, through the application of appropriate phytosanitary measures

Processed wood material
Products that are a composite of wood constructed using glue, heat and pressure, or any combination thereof

Quarantine pest
A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled

Raw wood
Wood which has not undergone processing or treatment

Regulated pest
A quarantine pest or a regulated non-quarantine pest

Refusal
Forbidding entry of a consignment or other regulated article when it fails to comply with phytosanitary regulations

Regulated article
Any plant, plant product, storage place, packaging, conveyance, container, soil and any other organism, object or material capable of harbouring or spreading pests, deemed to require phytosanitary measures, particularly where international transportation is involved

Release (of a consignment)
Authorization for entry after clearance

Round wood
Wood not sawn longitudinally, carrying its natural rounded surface, with or without bark

Sawn wood
Wood sawn longitudinally, with or without its natural rounded surface with or without bark

Technically justified
Justified on the basis of conclusions reached by using an appropriate pest risk analysis or, where applicable, another comparable examination and evaluation of available scientific information

Treatment (as a phytosanitary measure)
Official procedure for killing, inactivating, removing, rendering infertile or devitalizing regulated pests

Treatment schedule
The critical parameters of a treatment which need to be met to achieve the intended outcome (i.e. the killing, inactivation or removal of pests, or rendering pests infertile, or devitalization) at a stated efficacy

Wood (as a commodity)
Commodities such as round wood, sawn wood, wood chips and wood residue, with or without bark, excluding wood packaging material, processed wood material, and bamboo and rattan products

Wood packaging material
Wood or wood products (excluding paper products) used in supporting, protecting or carrying a commodity (includes dunnage)

Appendices

Appendix 1
Examples of regulated wood packaging material

©BMEL/T. Schroeder

Wooden pallets

©BMEL/T. Schroeder

Wooden pallet load boards

© C. Cremonini

Crates made from solid wood

©BMEL/T. Schroeder

Box made from solid wood

©BMEL/T. Schroeder

Ammunition boxes made from solid wood

©BMEL/T. Schroeder

Fruit box made with solid-wood corner pieces that are larger than 6 mm

©BMEL/T. Schroeder

Composite box made from solid and processed wood

©BMEL/T. Schroeder

Crate made from solid wood and metal

©BMEL/T. Schroeder

Cargo box made from solid and processed wood

©BMEL/T. Schroeder

Champagne boxes made from solid wood more than 6 mm thick

©BMEL/T. Schroeder

Crate made from solid and processed wood

©BMEL/T. Schroeder

Box made from solid and processed wood

© C. Cremonini

Heavy industrial wood packaging, including blocking (pieces of wood that are used to support sawn wood)

©BMEL/T. Schroeder

Wooden cage used to secure granite stones

©BMEL/T. Schroeder

Cable drums made from solid wood

© C. Cremonini

Crates made of solid wood

©BMEL/T. Schroeder

Solid wood dunnage

©BMEL/T. Schroeder

Solid wood dunnage

©BMEL/T. Schroeder

Solid wood dunnage

Appendix 2
Examples of articles that are exempted from ISPM 15

© Canadian Food Inspection Agency

Plywood and metal pallets

© Canadian Food Inspection Agency

Plastic and fibre-form pallets

©BMEL/T. Schroeder

Dunnage that is integrated into packs of wood, such as the spacers or blocks indicated by arrows in this photograph, is not wood packaging material and does not need to be individually marked

©BMEL/T. Schroeder

Wine barrels treated with heat during production process

©BMEL/T. Schroeder

Antique jewellery box

Appendix 3
Example of a checklist for ISPM 15 treatment providers and wood packaging material manufacturers, repairers and remanufacturers

1. ADMINISTRATIVE

- ☐ Company name
- ☐ Company certification number (*issued by NPPO*)
- ☐ List of documented procedures, revision dates and version number
- ☐ Company address
- ☐ Mailing address (*if different than company address*)
- ☐ Hours of operation
- ☐ Contact information (*phone number, email of company contact person*)
- ☐ Review and amendment log
- ☐ Table of contents
- ☐ Type of company (e.g. treatment provider, wood packaging material (WPM) manufacturer, WPM repairer, WPM remanufacturer)
- ☐ Treatment providers should specify the type of ISPM 15 treatment (e.g. HT, DH, MB, SF)
- ☐ Wood packaging material manufacturers, repairers and remanufacturers should identify their inputs and outputs and whether they produce new, repaired or remanufactured WPM. If they produce new WPM, they should identify whether they produce WPM from treated timber or the WPM is treated after assembly.

2. STAFF TRAINING

The procedures used to ensure that staff responsible for phytosanitary activities are competent

- ☐ Description of training
- ☐ Frequency of training
- ☐ Description of how employees are evaluated or tested
- ☐ Sample of test (*if applicable*)
- ☐ Training record provided in appendix, which includes:
  - ☐ Employee name
  - ☐ Topic of training
  - ☐ Trainer
  - ☐ Date of training
  - ☐ Indication whether employee passed evaluation or test
  - ☐ Signature line for trainee
  - ☐ Signature line for trainer

3. NONCONFORMITIES

The procedures used by the registered company to record, address and follow up on internal nonconformities that may occur during routine operations

- ☐ Procedure for reporting and documenting nonconformities (To whom are nonconformities reported? How are they documented? Who is responsible for ensuring corrective actions are implemented?)
- ☐ Examples of nonconformities
- ☐ Sample nonconformity report in appendix, which includes:
  - ☐ Date nonconformity was identified
  - ☐ The name of the person issuing the nonconformity report
  - ☐ The name of the person who reported the nonconformity
  - ☐ The name of the person responsible for implementing the corrective actions
  - ☐ A description of the nonconformity and root cause
  - ☐ A description of the corrective actions taken immediately
  - ☐ A description of the corrective actions taken to prevent recurrence
  - ☐ Date or dates the corrective actions are implemented
  - ☐ The name of the person who ensures the corrective actions are implemented
  - ☐ The date the nonconformity case is closed

4. DOCUMENTATION AND RECORD-KEEPING

The procedures used to document the following: treatments; production of wood packaging from ISPM 15-treated wood products; confirmation that purchased wood has been appropriately treated in a compliant facility and that only wood products that comply with requirements are shipped

- ☐ The retention period for all records and completed forms used by the company to track phytosanitary activities or procedures are retained for a minimum of two years (e.g. purchasing records, training records, audit reports, heat treatment certificates, kiln treatment charts, records of nonconformities)
- ☐ The name of the person responsible for maintaining the quality-management system
- ☐ A statement saying employees are notified of changes to the quality-management system
- ☐ A statement saying changes to the quality-management system are recorded in the amendment log
- ☐ Retention period for programme documents (required records to demonstrate how a facility meets the relevant national legislation and NPPO policies related to ISPM 15)
- ☐ Examples of programme documents (e.g. treatment records, training records)
- ☐ A statement saying which national legislation or NPPO policy documents are relevant to the company

5. PURCHASING AND TIMBER IDENTIFICATION

The procedures used to ensure traceability of treated wood products back to treatment by an authorized treatment provider and the procedures used to ensure that treated wood products are only sourced from registered providers or facilities and are traceable to those providers or facilities

- ☐ A statement saying that the timber used to construct certified wood packaging must be clearly identified as treated and traceable to an authorized treatment provider
- ☐ The ways in which timber can be identified, upon receipt, as having been treated in an approved manner are described
- ☐ The documents on which the treatment provider number and treatment status of the received timber is noted and is connected to records attesting to its purchase
- ☐ A description of how timber identification and traceability is maintained after reception (e.g. writing the purchase order number on the bottom piece, using internal tags)
- ☐ A description of the type of timber purchased – whether the company buys pre-cut components or dimensional timber, and whether the latter is cut and put back into the inventory or cut to order (if cutting and putting back into the inventory, the description must include an explanation of how traceability to treatment is maintained)
- ☐ A description of how offcuts that are kept for use in certified wood packaging are managed or controlled
- ☐ If the company sells components to other registered companies, a description of how that timber is to be identified and traceable to a source of treatment
- ☐ If the company treats timber, a description of how that timber is identified and traced back to the kiln charge (load) or fumigation records

6. SEGREGATION

The procedures used to segregate treated from untreated wood packaging, including where repair or remanufacture of WPM is undertaken

- ☐ A statement saying that treated and untreated timber and wood packaging will be kept segregated
- ☐ A description of how treated and untreated timber and wood packaging will be kept separate (e.g. signage, zones)
- ☐ Traceability of treated wood from the treatment stage through to storage and despatch

7. PRODUCTION OF WOOD PACKAGING MATERIAL

7.1 New wood packaging material

Procedures used in the production of WPM

- ☐ A description of production flows (i.e. steps taken to bring timber or components as raw material to finished product) and how the raw materials remain traceable to source of treatment and to records attesting to purchase throughout production (e.g. via work order or production log)
- ☐ A statement saying who is responsible for stamping and at what point in the manufacturing process it occurs

- ☐ A sample work order, production log, daily production sheet or cut list in appendices, if applicable. If a work order is used, the work order must include:
  - ☐ Production date
  - ☐ Customer
  - ☐ Builder
  - ☐ Quantity
  - ☐ Description or size of wood packaging
  - ☐ Timber source
  - ☐ If the company produces dunnage, a description of how it is controlled and marked

7.1.1 Unassembled packaging

Procedures used in the production and sale of kits of unassembled WPM

- ☐ A statement saying records of sales of kits are kept for a minimum of one year
- ☐ Records should include the customer's name, the number of units sold, and the fabrication date
- ☐ A description of how components are marked, packaged, and shipped

7.2 Recycled wood packaging material (reused, repaired or remanufactured)

Procedures used in the reuse, repair or remanufacturing of WPM

- ☐ A description of any recycling activities that are undertaken (i.e. examination and reuse, repair, remanufacture or decommissioning)
- ☐ A description of the process for each activity listed
- ☐ If maintaining certification (i.e. authorization), a description of how the company verifies that all existing marks are legible and conform to ISPM 15 and a statement that used pallets are inspected for nonconforming repairs before allowing the product to be resold or moved from the approved facility
- ☐ If repairing wood packaging, a description of how the one-third repair rule is applied and where the repair materials are sourced
- ☐ If decommissioning wood packaging, a description of when, where and how marks are obliterated or removed
- ☐ A description of how recycled products are segregated after processing

8. ISPM 15 TREATMENTS

Procedures to ensure that the wood or WPM is treated consistently and in accordance with the relevant ISPM 15 treatment schedule. Process controls and operational parameters should be established to provide the details necessary for approval of the treatment facility or authorization of the treatment provider. Calibration and quality-control procedures should be documented by the treatment provider.

As a minimum, the written procedures should include the following:

- ☐ Commodity-handling procedures before, during and after treatment
- ☐ Orientation and configuration of the commodity during treatment (as appropriate, depending on the type of treatment)
- ☐ Critical process parameters and the means for measuring them
- ☐ Procedures for temperature sensor, gas sensor, humidity sensor, and moisture meter calibration and recording (as appropriate, depending on the type of treatment)
- ☐ Contingency plans and corrective actions to be taken in the event of treatment failure or problems with critical treatment processes
- ☐ Procedures for handling rejected lots
- ☐ Record-keeping and documentation requirements
- ☐ ISPM 15 marking
- ☐ Training of personnel
- ☐ Segregation of treated and untreated wood

9. BARK

- ☐ A description of the allowable amount of bark
- ☐ A description of when products are inspected for bark
- ☐ A description of how excess bark is removed

10. APPLICATION OF THE ISPM 15 MARK

Procedures for applying the ISPM 15 mark and controlling its use and a description and example of an ISPM mark)

- ☐ A description of the process for applying the ISPM 15 mark and ensuring legibility
- ☐ An explanation of how the ISPM 15 mark is controlled
- ☐ A list of staff members who are authorized to apply the mark
- ☐ A description of how the work is tracked (e.g. work order)
- ☐ A statement saying which colour ink is used
- ☐ An image of the regular mark and the dunnage mark (if applicable) is provided

Appendix 4
Example of an ISPM 15 authorized entity register

LAST UPDATED: YYYY-MM-DD

The ISPM 15 authorised entity register lists all treatment providers and wood packaging manufacturers, repairers and remanufacturers who are authorized by the [*NPPO of country*] and meet the requirements of ISPM 15 (*Regulation of wood packaging material in international trade*).

Registration number	Registration status[1] (Date)	Treatment provider/ WPM manufacturer/ WPM repairer/ WPM remanufacturer	Type of treatment[2] (HT, DH, MB, SF)	Company name and address	Contact information	Example of company mark

Notes:

[1] Registration status: authorized, probationary, withdrawn, suspended or revoked.

[2] DH, dielectric heat treatment; HT, heat treatment; MB, methyl bromide fumigation; SF, sulphuryl fluoride fumigation; WPM, wood packaging material.

Appendix 5
Examples of bark on wood packaging material

APPENDIX 5.1: EXAMPLES OF COMPLIANCE WITH ISPM 15 DEBARKING REQUIREMENTS

© C. Cremonini

Bark on the edge of the board is less than 3 cm wide and therefore the pallet complies with bark tolerances

© Canadian Food Inspection Agency

Bark on edge of board is less than 3 cm wide and therefore the board complies with bark tolerances

© Canadian Food Inspection Agency

Board with knife on it is compliant because the knife is 2 cm by 15 cm and so the bark on the edge of the board is within tolerances; the board below it only contains discoloured cambium (no bark) and is therefore also compliant

APPENDIX 5.2: EXAMPLES OF NON-COMPLIANCE WITH ISPM 15 DEBARKING REQUIREMENTS

© C. Cremonini

Bark exceeds tolerances: this unit of wood packaging material does not comply with ISPM 15

© Canadian Food Inspection Agency

Bark on the edge of the wood is wider than 3 cm and the piece is greater than 50 cm²: the bark must be removed, or the piece may not be used for dunnage or to construct wood packaging material

© Canadian Food Inspection Agency

Bark exceeds tolerances: this ship-borne dunnage does not comply with ISPM 15

©BMEL/T. Schroeder

Bark exceeds tolerances: this wooden crate does not comply with ISPM 15

Appendix 6
Examples of insects and insect signs in association with wood packaging material

©BMEL/T. Schroeder

Asian long-horned beetle emerging from wood packaging material

©BMEL/T. Schroeder

Living cerambycid larva in wood packaging material

©MAPA/S. Aguiar, VIGIAGRO

Fresh sawdust and wood residues may be a sign of an active insect infestation

© C. Cremonini

*Dead adult wood wasp (*Sirex *sp.): finding dead organisms is not a sign of non-compliance with ISPM 15*

Appendix 7
Examples of compliant and non-compliant ISPM 15 marks

APPENDIX 7.1: EXAMPLES OF MARKS THAT COMPLY WITH ISPM 15

©BMEL/T. Schroeder

Example of an ISPM 15 mark applied to the oriented-strand-board component of a wood packaging material unit for improved visibility. The mark should be interpreted by NPPOs as confirmation that the entire unit is ISPM 15-certified

©BMEL/T. Schroeder

Mark, applied with a fire-brand stamp, matches example 1 of Annex 2 of ISPM 15

©BMEL/T. Schroeder

Mark, applied with an ink stamp, matches example 1 of Annex 2 of ISPM 15 and has additional information adjacent to the mark

©BMEL/T. Schroeder

Mark, applied with an ink stamp, matches example 1 of Annex 2 of ISPM 15

©BMEL/T. Schroeder

Mark matching example 1 of Annex 2 of ISPM 15 has additional information adjacent to the mark to indicate that the material is certified for use as dunnage

©BMEL/T. Schroeder

Mark, applied with a fire-brand stamp, matches example 2 of Annex 2 of ISPM 15

©BMEL/T. Schroeder

Mark, applied by an inkjet printer, is similar to example 2 of Annex 2 of ISPM 15 but producer/treatment-provider code is split over first and second line

©BMEL/T. Schroeder

Mark, applied with a fire-brand stamp, is similar to example 2 of Annex 2 of ISPM 15 but producer/treatment-provider code is split over first and second line

©BMEL/T. Schroeder

Mark, applied with a fire-brand stamp, is similar to example 2 of Annex 2 of ISPM 15 but producer/treatment-provider code is split over first and second line

©BMEL/T. Schroeder

Mark, applied with an ink stamp, matches example 1 of Annex 2 of ISPM 15 but with rounded corners to the outer border as in example 3

©BMEL/T. Schroeder

Mark, applied by stencilling, matches example 4 of Annex 2 of ISPM 15, with small gaps in the border and the vertical line

©BMEL/T. Schroeder

Mark with country code, producer/treatment-provider code and treatment code presented on the same line and separated by hyphens, as per example 6 of Annex 2 of ISPM 15

APPENDIX 7.2: EXAMPLES OF MARKS THAT DO NOT COMPLY WITH ISPM 15

©BMEL/T. Schroeder

Hand-drawn mark

©BMEL/T. Schroeder

Transferable mark (mark must not be transferable; tags are non-compliant with ISPM 15)

©BMEL/T. Schroeder

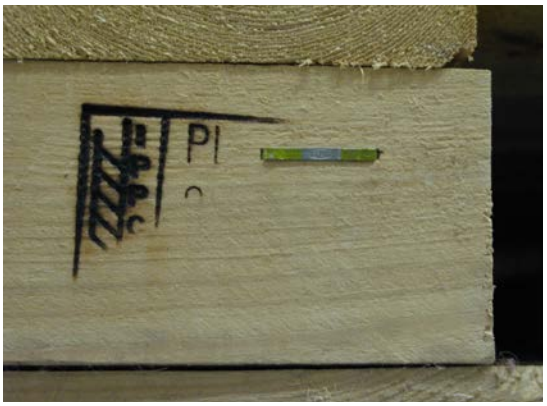
Border around mark is missing

©BMEL/T. Schroeder

Vertical line to right of symbol is missing

©BMEL/T. Schroeder

Vertical line to right of symbol is missing, additional information is included within mark, and mark is applied to processed wood



©BMEL/T. Schroeder

Mark is incomplete

©BMEL/T. Schroeder

Mark is incomplete

©BMEL/T. Schroeder

Fraudulent mark with invalid codes (no country with code "FE" and no treatment with code "OH")

© MAPA/G. Farias, VIGIAGRO

Mark is damaged and not legible

©BMEL/T. Schroeder

Mark is not legible

©BMEL/T. Schroeder

No hyphens between ISO country code, producer/treatment-provider code and treatment code

©BMEL/T. Schroeder

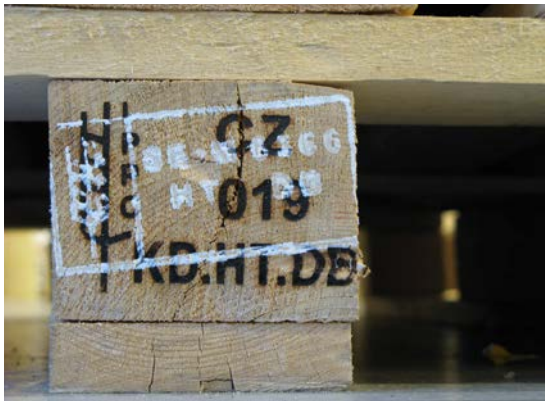
Second hyphen in producer/treatment-provider code

©MAPA/G. Farias, VIGIAGRO

Two different ISPM 15 marks on one piece of wood packaging

©BMEL/T. Schroeder

Two different ISPM 15 marks on one pallet block



©BMEL/T. Schroeder

Two different ISPM 15 marks printed into each other

IPPC

The International Plant Protection Convention (IPPC) is an international plant health agreement that aims to protect global plant resources and facilitate safe trade. The IPPC vision is that all countries have the capacity to implement harmonized measures to prevent pest introductions and spread, and minimize the impacts of pests on food security, trade, economic growth, and the environment.

Organization

- There are over 180 IPPC contracting parties.
- Each contracting party has a national plant protection organization (NPPO) and an official IPPC contact point.
- Ten regional plant protection organizations (RPPOs) have been established to coordinate NPPOs in various regions of the world.
- The IPPC Secretariat liaises with relevant international organizations to help build regional and national capacities.
- The secretariat is provided by the Food and Agriculture Organization of the United Nations (FAO).

Did you read this guide?

Please send an email to ippc@fao.org and share your feedback.

Your responses will help the IPPC Secretariat and the IPPC Commission on Phytosanitary Measures (CPM) Implementation and Capacity Development Committee (IC) strengthen this and other guides and training resources.

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