Decision Support System for Managers
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Module - 04
Lecture – 23
Material Safety and Safety Equipments

Hello and welcome to "Decision Support Systems for Managers"; we are into module 4 and lecture 8 of this module that is 'material safety and safety equipments'; and the module is 'decision support systems for materials managers'; ok. Now, in the previous few lectures, we have covered the entire gamut of warehousing and materials management; we also just in the previous module, we spoke extensively on ergonomic workstations and we have emphasized on the need to have very-very scientifically studied ways of working.

So, that your physical body does not get damaged or harmed; because you are working at a place every day at least 10 hours per day for week, month, year after year. So, your human body should not be disadvantaged because of working conditions. So, ergonomic workstations is a cause of concern and a great area of concentration for businesses today, ok. And you know MNCs that are coming in now in India, they are now asking for these things that are do you; we want to see your workstations, we want to see how you are working; ok.

And if it is not we want to see the health of your workers, nutrition of your workers. If it is not happening in a particular way that we are recommending these things, only if you fulfill; then only we will enter into business agreement with you. So, ergonomic workstations is very-very important; ok. Today we will look into material safety and safety equipments; ok.

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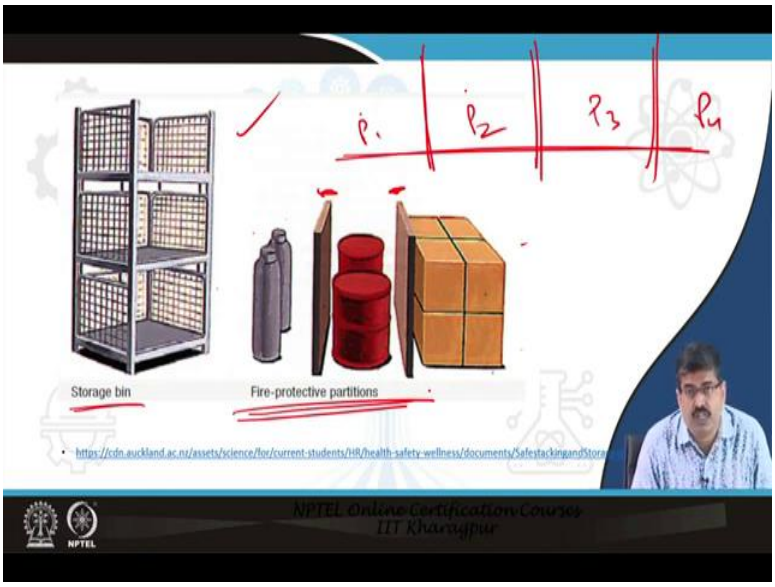
Material safety.



Let us take this first this, this today's lecture is full of diagrams, ok. On the extreme left hand side is something called storage bin, ok. What are the advantages of this type of a structure? On the extreme left hand side there is something called a storage bin; what are the advantages of this type of a structure? One is it is rack based, so you can store more one over the other; second thing is if you see it as a netting on all the sides, that means it cannot spill over.

Third thing is this netting, netting also means that air can pass through. So, if you can in case you require to store a product which requires air to pass through, this netting can work; this netting can work. So, this is one way of store storage bin. Second this is you see the screen it is very very interesting, this is called as fire protective partitions.

So, if you are having one rack like this huge length, lengthy rack. So, you are storing product 1 here, product 2 here, product 3 here, product 4 here; it is like you know you go on to Big Bazaar, one huge length of a rack, portions of its storing atta, another portion is storing maida, then it is storing soaps, then it is storing shampoo.

So, one rack product 1, product 2, product 3, product 4. Now, it might be, now let us come to warehouse same thing; let us come to warehouse setting, same thing product 1, 2, 3, 4. Now, it might be that these two products are inflammable that is they might catch fire. So, what you need? You need a protective barrier between these two which is fire resistant; you need a protective barrier right, this is what it is actually, this is these are the protective barriers.

This is just a small diagram that is given, but in reality it will be huge blocks ok; block 1, block 2, block 3; block 1, block 2, block 3, so these are huge barriers sorry, these are protective barriers and blocks are pretty big, right ok. So, these are your fire protective partitions, agreed. So, this is again one way of racking; you have to be very careful with this with warehouses which are storing inflammable material, in chemicals is an example of inflammable materials.

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Now, this is a pallet, this is again some as we said material safety. Certain materials may cause or may attract moisture; so if you keep them on the floor, then you know that the one the product that is coming in direct contact with the floor will get damaged ok, will catch moisture and will become unusable, ok. So, these products need to be put on pallets.

Second thing, so then the moisture does not catch. Second thing is say refrigerator, it has to be put on a pallet; television sets better to keep on a pallet. Why? You know if you keep a refrigerator in the ground, there is no harm; but then what will happen?

Suddenly if this is a refrigerator, suddenly if a forklift is going and by any chance if it hits or something. So, then this refrigerator gets dented. Now, it gets dented, you cannot sell it at a good price. So, this pallets is sometimes very-very essential; right.

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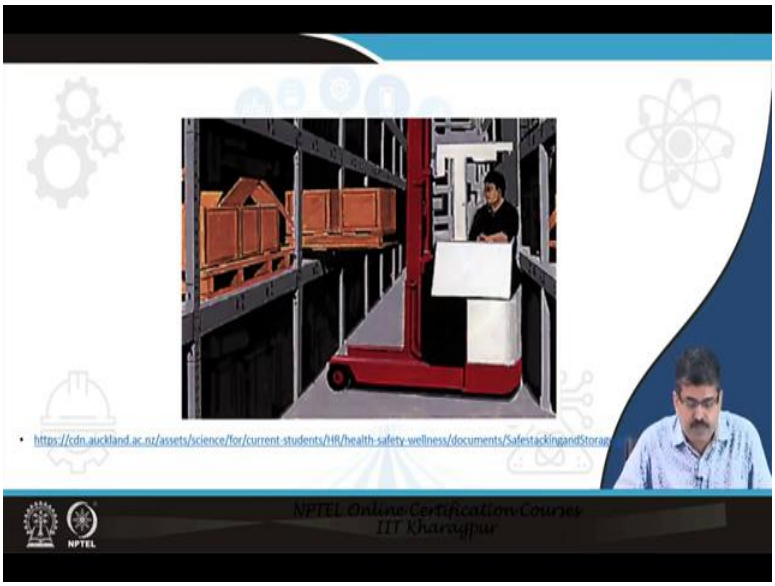

And this is again a diagram where you will see that this person with the forklift, the red colored thing is the forklift and it is bringing out material from the racks. You will see that cardboard pallets is jutting out; that means is bringing out this material. Now, you see there is enough gap between two cartons that is what is required.

So, that if I am bringing out one from the racks, it should not hit the other products in the same rack; and the other product should not fall, just like the [FL] (Refer Time: 06:53) and it should not fall like that; clear!

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This is another example look at it; there is a called lane and aisle marking; lane and aisle marking.

What are these? You see a yellow colored strip on both. So, when a forklift is going, it should not go into that zone which is beyond that yellow color; it should fall it should travel within that boundary outside that yellow color, so that yellow color boundary is for storing, no forklift should cross the yellow color line. Similarly, no product should spill beyond the yellow colored line also.

Why is this done? This we will deal with in lecture 10. You know most of the warehouses two things; one is social responsibility, Corporate Social Responsibility CSR and the second is cost reduction that, most warehouses are now employing workers who are somewhat differently disabled or differently abled and apologize for it some, they are employing people who are differently abled and also there are warehouses who are employing people, who might not be that educated.

So, for them, if you are working with these types of people who are either differently abled or maybe not too much educated; you know they might not understand where to keep a product, how to keep it.

So, for them these markings help; do not go beyond this marking. So, you do not need to explain them the width of a forklift and how much space it will take; you just draw a line and say that beyond this please do not keep any product. Look at the carton at the back it has a yellow box again, you know that is a stacking I think 1, 2, 3, 4; 4 stackings at the back.

So, yellow piece of line is put around; that means that, that will be stored there only. So, I see these are certain things which are called as lane and aisle marking.

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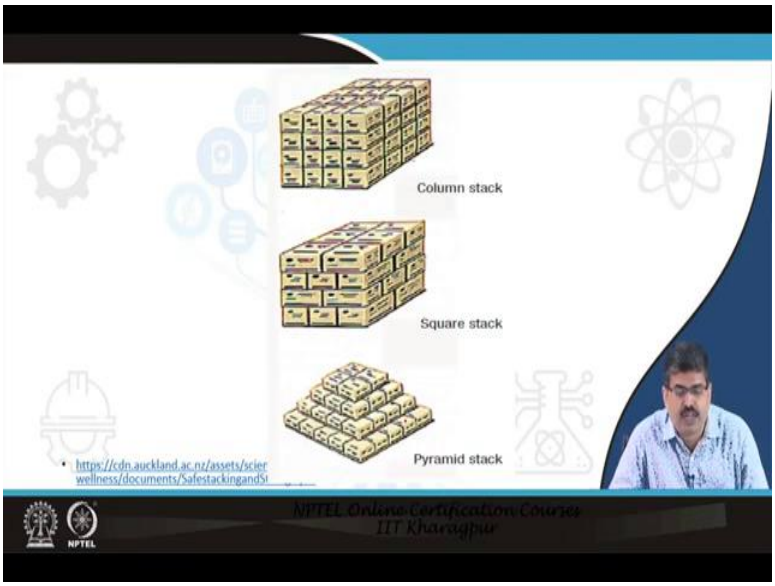

Now, let us see, first one is column stack, ok. Column stack is lengthwise; the middle one is square stack, square tag means row and columns are same and the last one is pyramid stack. You know when in a pyramid stack; when will use a pyramid stack and when will you use a square stack or a column stack?

Square stack will be used when your cartons are rigid in shape ok; when your cartons are rigid in shape. Take an example, you have Horlicks or Complan the paper curve, the paper packets, the cardboard packets and you have cooking oil the one liter packets; which one can you store in a square format? The Complan packets because they will not change their shape.

So, you can keep, keep them and one over the other you can keep them, they will not change their shape; but if you are keeping cooking oil, it is difficult to keep them one over the other, they will tilt. So, for them the bottom one the pyramidal stack is very useful. So, you keep bottom more, then less, then less; so it balances itself among within the shape of the plastic packet, ok. So, this is a pyramidal stack.

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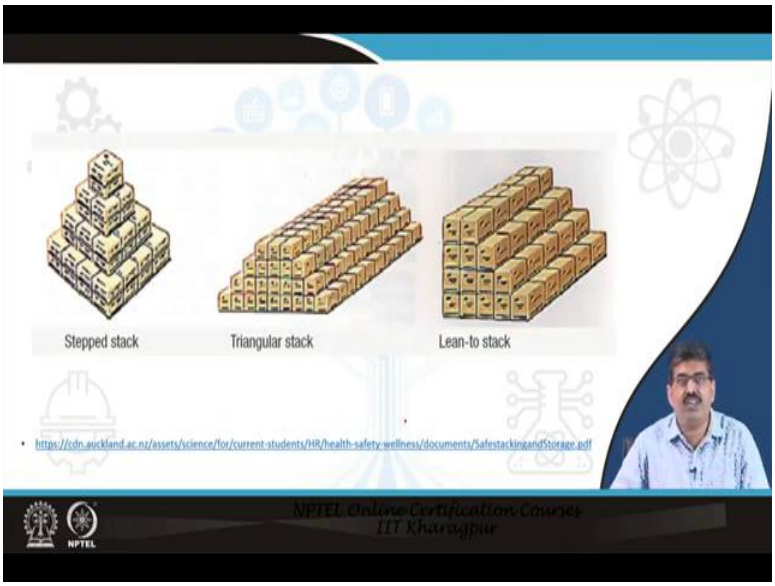

Similarly, step stack, triangular stack, lean to stack all these are examples of different types of stacking, ok. This lean to stack; the last one, when this is important you know, lean to stack? If you are storing biscuits it is very important, useful; because if you keep on biscuit, if you keep one over the other, you know the bottom biscuit packet will be broken.

So, that is why biscuits are kept in cartons and even those cartons if you can; if it is a product that is not in cartons, then this lean to stack helps; clear!

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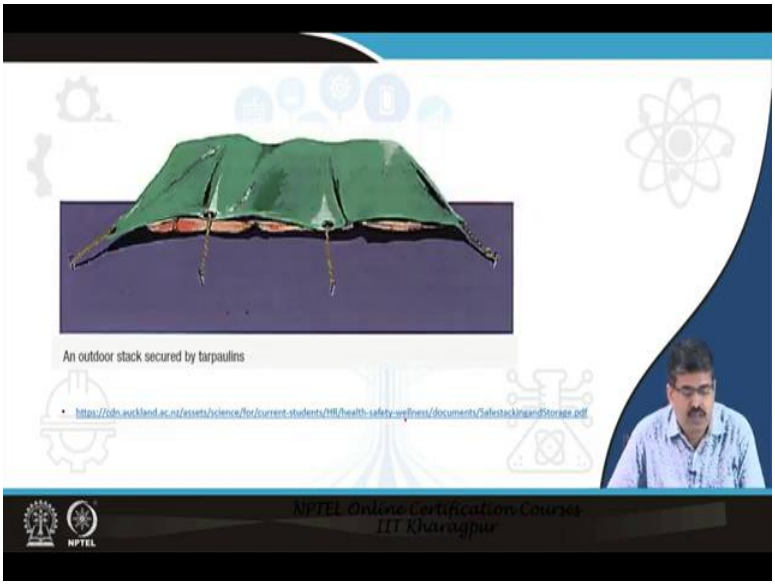

This is an outdoor stack secured by tarpaulin ok, outdoor stack secured by tarpaulin. Basically you are keeping rice or wheat and you are putting a tarpaulin on top, two reasons you know; what are the two reasons?

One is protecting against the sun and the rain, second is protecting its damp; because you see, if you see a tarpaulin, it is very-very effective. And the third is, if you put a tarpaulin you can just by a visual glance; you can find out whether some sack inside is missing. You know why? Because that portion will sag, tarpaulin will sag at that end tarpaulin.

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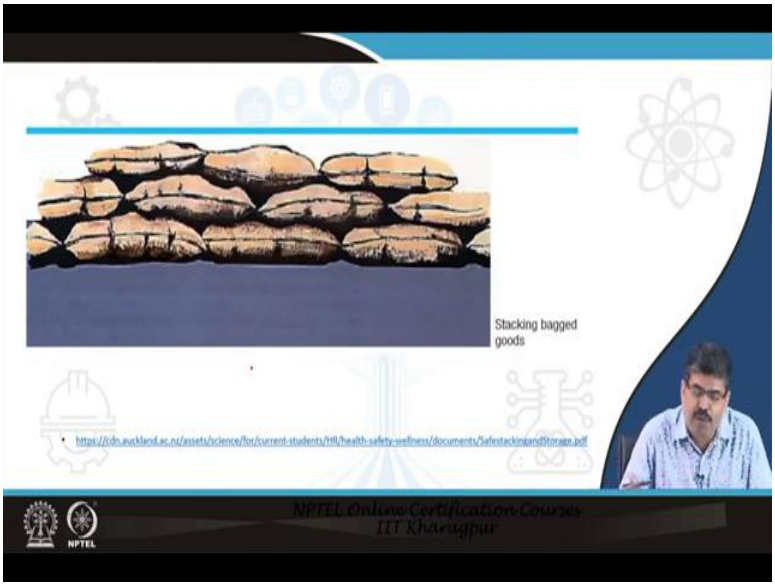

This is stacking of bagged goods, here you are not putting tarpaulin; you are just stacking them ok, stacking of bagged goods, right. You notice the diagram very carefully and this one is taking the position in the middle ok, this one is taking the position in the middle; ok.

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This is a drum rack very beautifully drawn diagram. Notice that the these are the circular nature, here is a this, so that the drum can stay inside right. So, the drum can stay inside, agreed this is the drum rack; clear!

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This is the pipe storage, again same thing; it is it cannot be one over the other, it has to be within the this way right, just like our, ok. So, it balances right and then you can do a lashing, clear. So, pipe storage, right. Now, here if you see the, it is stored on a piece of

carton. So, sorry it is stored in a piece of pallet; you know why it is stored in a piece of pallet?

Because tomorrow the forklift can come, put the forks here and take away the entire thing and put in a truck; clear!

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This is a steel storage; this is steel storage; the steel sheets are stored in the racks here; ok; the steel sheets are stored in the racks here. Steel sheets are stored in the racks; right.

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This is a flammable liquid storage, flammable liquid storage; victim as you can see it has temperature control, it has electric control sockets, etc.; flammable liquid storage; right.

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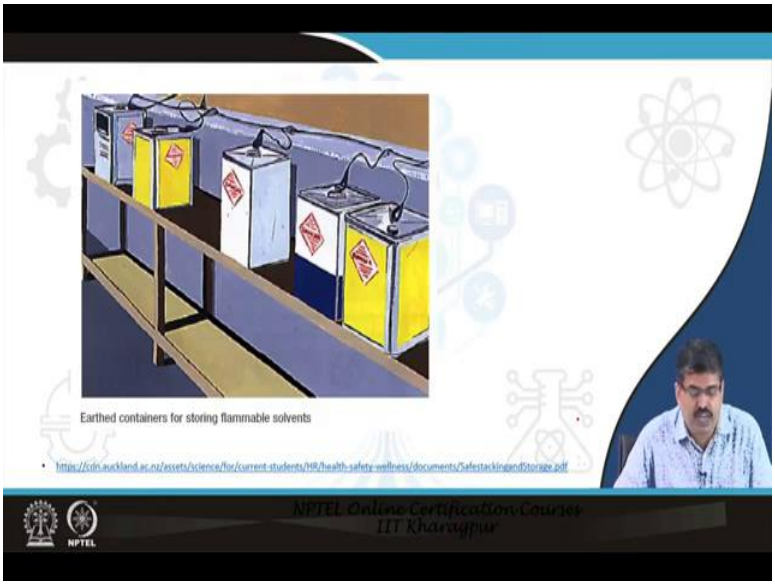

These are again earthed containers for storing flammables solvents; earthing is done to prevent any short circuit; ok, earthed containers for storing flammable solvents; right.

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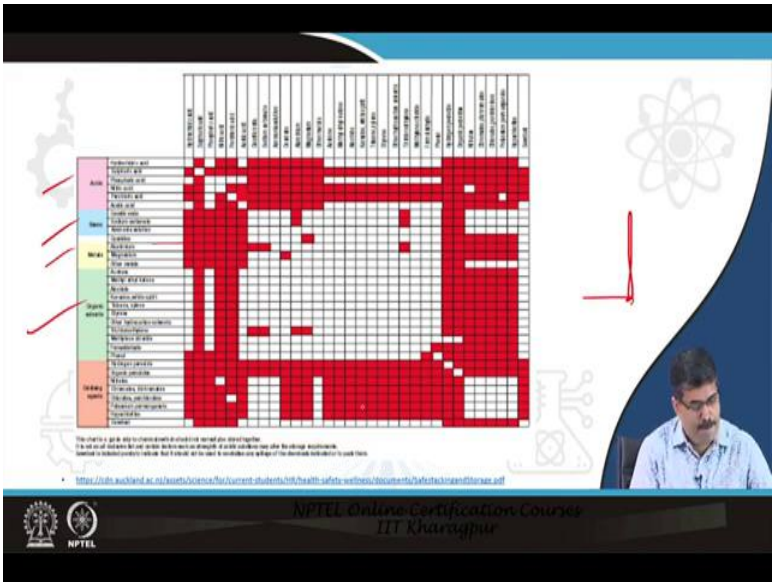

Now, this is a chart, I mean you may not be able to see it in your computer screen properly; but I have given the reference at the bottom, you can just refer to this PDF document where you will get a better picture of this.

What this chart says, it gives a list of acids and bases, metals, organic substance ok; it gives a list of such; it gives a list of acid, bases, acid, bases, metals, organic substance. And it tells you how if these products are kept side by side; then will is there any risk of a chemical reaction, explosion anything like that. So, it tells us, if they are kept side by side; is there any risk for chemical reaction or explosions? This red means that, this one and this one you cannot keep side by side, it is a matrix basically.

This one and this one you cannot keep side by side and this white ones means, there is no problems, ok. So, this anyway this is not quite visible on the screen, particularly the description of the items; but I have given the references at the bottom, you can just click on that reference and get this full list of items which are this. This is a checklist actually, checklist that can be used in a warehouse which are the items that you can store side by side, which ones you cannot store side by side.

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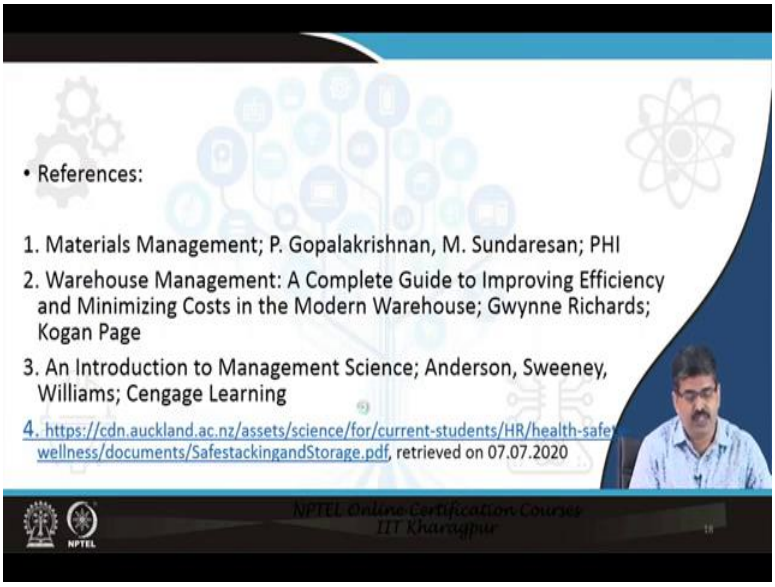

This is the references, now so this is. Now, I just want to tell you about some things just give me a second; I just want to tell you something regarding this, here comes in this original thing that with which we started that is material safety, you know certain and these are all equipments that are in enabling material safety. You know there are certain elements, there are certain chemicals; you know if you are working in such a warehouse, you will have to be properly attired.

Safety boots, some certain chemicals will be there where a particular level of friction is not desired. So, certain safety boots have to be such that, the friction is very less. In some cases certain safety boots have to be such that the pressure it is putting on the floor has to be very-very in a very soft manner, so that, that is again not; it does not go beyond a particular decibel.

Some something may explode, some chemical may explode; these are very very sophisticated warehouses dealing with these types of sophisticated material etcetera, and normally will have to be very careful with these things.

Now, this manganese wherever they are stored; manganese they are stored and tarpaulin is put on top, ok. Why? Because in manganese storage is huge; you cannot just store it under the shed ok, it requires huge space. So, manganese tarpaulin is put; one is again to protect the material, second is to prevent it from getting washed away; ok.

So, lot of these things are there. So, you have to be very-very careful when you are looking at warehousing and materials management. And in I think in the in module 10, that is after the next module; this is this is lecture 8, in lecture 10 we will deal with so many other issues which you will have to deal with as a materials manager, ok. As a materials manager as to the theft in warehouses, what to do if you if there is an insurance problem, health problem, etc.

Now, in the next class in the next lecture, what we will deal with is the ASRS system of warehouse management; that is automatic storage and replenishment system, AS automatic storage and RS replenishment system. So, automatic storage and replenishment system is very is very beautiful, ok. What it means is that; let us say you have a product which is there in the racks five pieces.

What will happen? People are coming, buying and going away. So, the stock comes down; go back to Big Bazaar or any other giant retail store example, the stock comes down. Two things might happen here; one is the store supervisor is going around and looking at which product stock has come down.

So, he will ask, he or she will ask that you replenish that stock, ok. The second thing that might happen is at the cash counter moment a product is getting sold, at the back end at this small warehouse that is associated to the retail outlet that stock position, the rack

stock position that is coming down, that is coming down. Now when that is coming down, they will immediately send products, send products to be refilled in the racks.

So, at any point in time, the racks will be having a specified number of pieces. So, if you are planning to have 20 packets of product a in the rack; if the stock has come down to 15, immediately another 5 will be put back to these racks, ok. Now, for a retail outlet, this has positives and negatives. As a consumer when we go into a store that is full, just full; one is we are very happy everything is available.

Second another thing is going at the back of my mind; does anyone come here, how come everything is full, nobody has buy purchased anything, nobody has bought anything. If people had bought, stock would come down, they will have less packets; nobody everybody has purchased everything, everybody no one has come. So, that is a marketing problem that is human psychology.

We one is we are happy at the same time we are a bit; I mean inquisitive as to whether anyone has come, anyone has not come etcetera, this is a problem, ok. But ASRS, system automatic storage and replenishment system, we need to give a command to the backend warehouse; for every product we need to identify a certain the safety stock level ok, moment it hits that level, we will get a replenishment.

Now, where does this ASRS system come from? It has come from the concept of safety stock level; moment is a product hits the safety stock or a reorders level, we should immediately reorder and fresh supply should come in before the existing stock gets exhausted. So, this is the ASRS system that we will learn. And lecture 10 of this module we will learn all the issues that warehouse manager faces day to day.

For example when you are dealing with workers from a nearby area, who live in that area within a particular radius; it is good beneficial, it is sometimes risky also. A worker just may choose not to come today erratic, but then it is a problem for you, ok. So, these are certain things that will come under ASRS system and issues in warehousing. So, that we will deal with in another class; ok.

So, these are the references. Now, as I mentioned that the diagram, or the acid base, that particular structure, we will show or that you can get as reference number 4. This diagram we will get as reference number 4; reference number 4; and of course, these are

two very-very beautiful books on warehousing, and introduction to management science, is anyway there. So, I think if you go through them, it will be very-very helpful.

Thank you!