

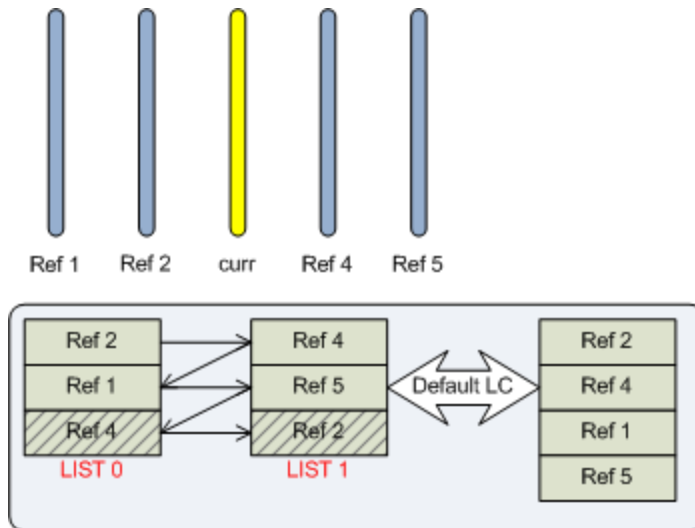


***JCTVC-I0220***  
***AHG15: Clarification of mapping process  
for reference picture lists combination***

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# Reference picture lists combination

- Combined list (LC) is used for uni-prediction in B slices
  - Default mapping process includes only *unique* pictures from L0 and L1

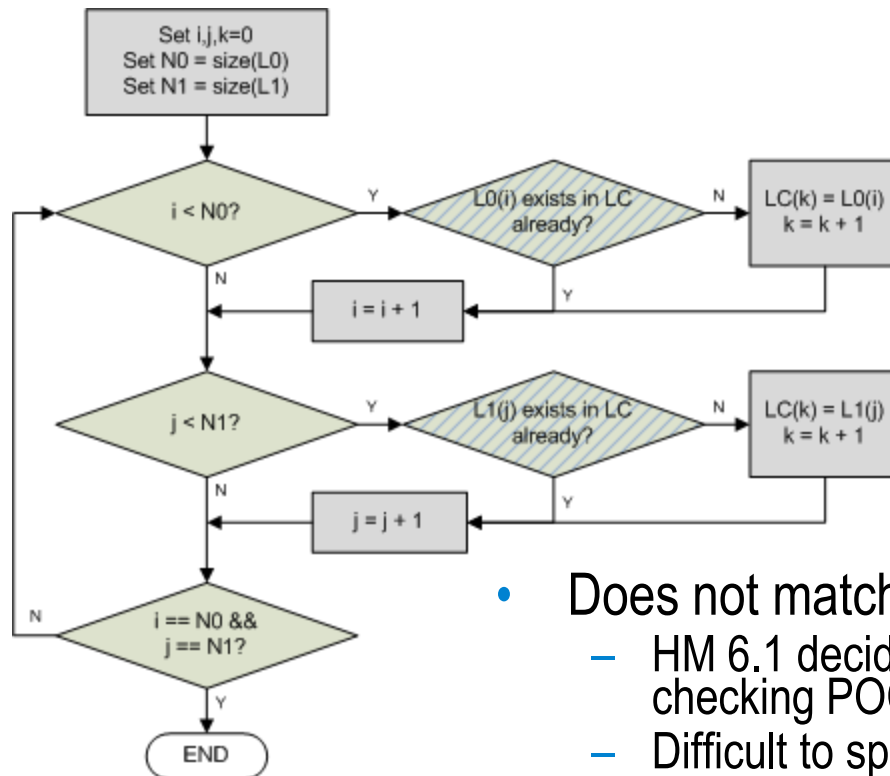


ref_pic_list_combination( ) {	Descriptor
if( slice_type % 5 == 1 ) { // b slice	
<b>ref_pic_list_combination_flag</b>	u(1)
if( ref_pic_list_combination_flag ) {	
<b>num_ref_idx_lc_active_minus1</b>	ue(v)
<b>ref_pic_list_modification_flag_lc</b>	u(1)
if( ref_pic_list_modification_flag_lc )	
for ( i=0; i <= num_ref_idx_lc_active_minus1; i++ ) {	
<b>pic_from_list_0_flag</b>	u(1)
<b>ref_idx_list_curr</b>	ue(v)
}	
}	
}	
}	



# The default LC mapping process

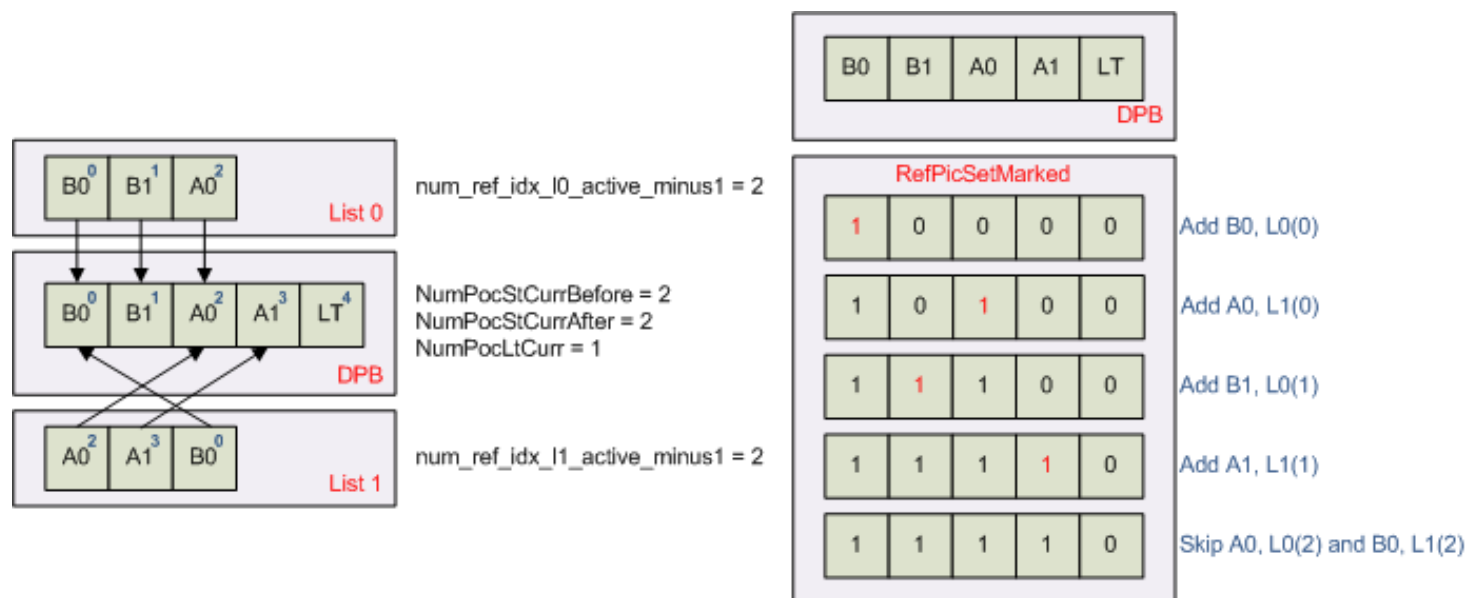
- Default mapping process for LC (8.3.4.3) is not clearly defined



- Does not match software implementation in HM
  - HM 6.1 decides if a reference picture already exists by checking POC
  - Difficult to specify in text

```
Bool bTempRefIdxInLC = true;
for ( Int iRefIdxLC = 0; iRefIdxLC < m_aiNumRefIdx[REF_PIC_LIST_C]; iRefIdxLC++ )
{
    if ( m_apcRefPicList[REF_PIC_LIST_0][iNumRefIdx]->getPOC() ==
m_apcRefPicList[m_eListIdFromIdxOfLC[iRefIdxLC]][m_iRefIdxFromIdxOfLC[iRefIdxLC]]->getPOC() )
    {
        bTempRefIdxInLC = false;
        break;
    }
}
```

- There is an explicit mapping relationship between entries in DPB and reference picture lists
- Use this relationship to identify unique pictures in L0 and L1
  - Also works when `ref_pic_list_modification_flag_lx = 1`
- No need to check POC repeatedly
- Easy to match text with HM software



When the current slice is a B slice and ref\_pic\_list\_modification\_flag\_l0 is equal to 0, the following ordered steps apply:

1. Let refIdxL0 and refIdxL1 be indices into the reference picture lists RefPicListL0 and RefPicListL1. They are initially set equal to 0.
2. Let refIdxLC be an index into PredLCToPredLx and RefIdxLCToRefIdxLx. It is initially set equal to 0.
3. Let RefPicSetMarked be an array of size NumPocTotalCurr. It is initially set to be all 0.
4. Let RefPicList0ToRPS be an array of size num\_ref\_idx\_l0\_active\_minus1+1. It is initialized to be  

$$\text{for}(\text{cldx} = 0; \text{cldx} \leq \text{num\_ref\_idx\_l0\_active\_minus1}; \text{cldx}++)$$

$$\text{RefPicList0ToRPS}[\text{cldx}] = \text{ref\_pic\_list\_modification\_flag\_l0} ? \text{list\_entry\_l0}[\text{cldx}] : \text{cldx}$$
5. Let RefPicList1ToRPS be an array of size num\_ref\_idx\_l1\_active\_minus1+1. It is initialized to be  

$$\text{for}(\text{cldx} = 0; \text{cldx} \leq \text{num\_ref\_idx\_l1\_active\_minus1}; \text{cldx}++) \{$$

$$\text{templdx} = \text{ref\_pic\_list\_modification\_flag\_l1} ? \text{list\_entry\_l1}[\text{cldx}] : \text{cldx}$$

$$\text{RefPicList1ToRPS}[\text{cldx}] = \text{templdx} < \text{NumPocStCurrAfter} ? \text{templdx} + \text{NumPocStCurrBefore} :$$

$$\text{templdx} < \text{NumPocStCurrAfter} + \text{NumPocStCurrBefore} ?$$

$$\text{templdx} - \text{NumPocStCurrAfter} : \text{templdx}$$

$$\}$$
6. The following process is repeated until refIdxL0 and refIdxL1 are both greater than num\_ref\_idx\_l0\_active\_minus1 and num\_ref\_idx\_l1\_active\_minus1, respectively:
  - If refIdxL0 is less than or equal to num\_ref\_idx\_l0\_active\_minus1,
    - ~~If the entry RefPicListL0[refIdxL0] is the first occurrence of the reference picture,~~ If RefPicSetMarked[RefPicList0ToRPS[refIdxL0]] is equal to 0
 
$$\begin{aligned} \text{PredLCToPredLx}[\text{refIdxLC}] &= \text{Pred\_L0}, & (8-12) \\ \text{RefIdxLCToRefIdxLx}[\text{refIdxLC}++] &= \text{refIdxL0}. \\ \text{RefPicSetMarked}[\text{RefPicList0ToRPS}[\text{refIdxL0}]] &= 1 \end{aligned}$$
    - refIdxL0++.
  - If refIdxL1 is less than or equal to num\_ref\_idx\_l1\_active\_minus1 ~~and ref\_pic\_list\_combination\_flag equal to 1,~~
    - ~~If the entry RefPicListL1[refIdxL1] is the first occurrence of the reference picture,~~ If RefPicSetMarked[RefPicList1ToRPS[refIdxL1]] is equal to 0
 
$$\begin{aligned} \text{PredLCToPredLx}[\text{refIdxLC}] &= \text{Pred\_L1}, & (8-13) \\ \text{RefIdxLCToRefIdxLx}[\text{refIdxLC}++] &= \text{refIdxL1}. \\ \text{RefPicSetMarked}[\text{RefPicList1ToRPS}[\text{refIdxL1}]] &= 1 \end{aligned}$$
    - refIdxL1++.

